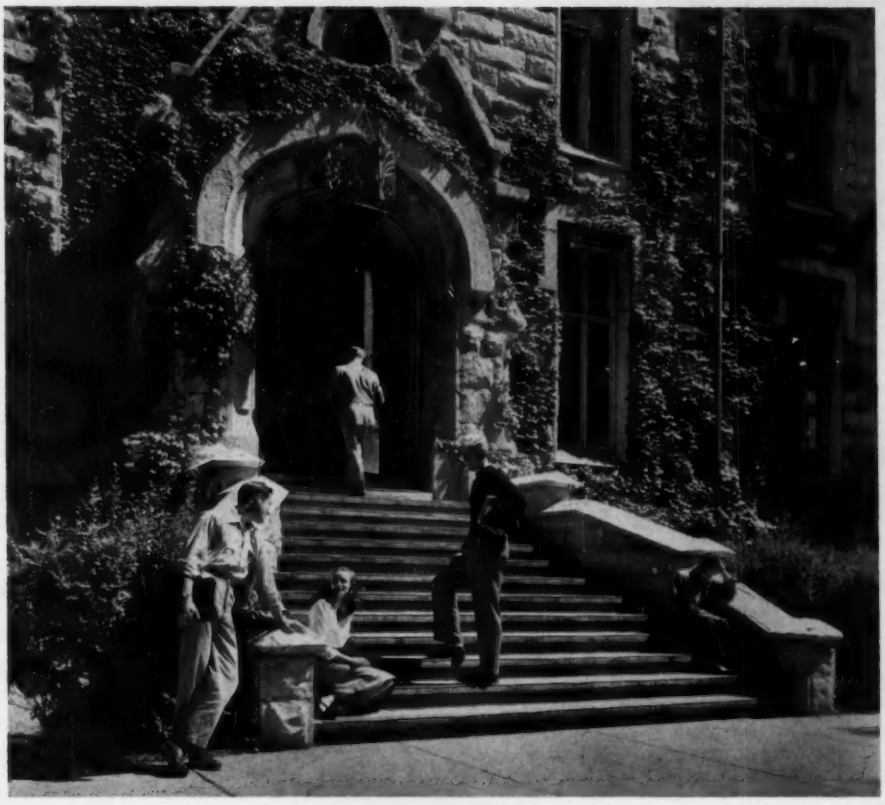
AUGUST 22, 1959
VOL. 157 — NO. 8

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
SINCE 1901



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FUTURE LEADERS

Business executives urging college graduates to develop their full potential in business careers. See page 21 for comments on the commencement address of AT&T president and report by Carnegie president.

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

FLASHES AND PLUGS

SIMIAN PSYCHOSIS. It was back in 1938 that the Canadian Bell Telephone Co. had to lick a ticklish classification program. Just how do you list a telephone installed in a chimpanzee's cage?

The chimp in question, named George, both resides and has his place of business in his quarters at Toronto's Riverdale Zoo. The telephone was necessary because George, a neurotic chap, needed to consult with his "psychiatrist" in Chicago.

The installation was listed as residence service since George wasn't using it for any monkey business.

In fact, after a long chat with the monkey talk expert, George returned to normal and has remained so ever since.

At 35, his mental health sound, he is believed to be the second oldest chimp in captivity and one of the few ever to own a telephone.

•

ENROUTE. A telephone company executive was finding it hard to write a letter of reference for his recent assistant.

Happy to see the former employe leave, he still felt he had no right to blight a budding career—nor to mislead another employer.

Finally, he dictated a single sentence:

"We believe this young man will go far, and are pleased to have had a part in helping him get started and keeping him moving."

•

DON'T TOOT, TOOTSIE. A deaf old lady entered the church with an ear trumpet.

As she was settling herself in her seat, an usher came over and whispered, "Listen, madam, one toot—and out you go."

•

COWED! "Oh, what a lovely cow," said the cute city-bred telephone operator. "But why hasn't it any horns?"

"There are many reasons," the farmer replied quietly.

"Some cows do not have horns until later in life. Others have them removed, while still other breeds are born without them. This one does not have horns because it happens to be a horse."

•

INVISIBLE MAN. A driver fined for passing another car at a railroad crossing called up the Wapakoneta (O.) *Daily News* to ask that his name be kept out of the paper.

But he refused to say who was calling.

CHANGE OF ADDRESS

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

AUGUST 22, 1959

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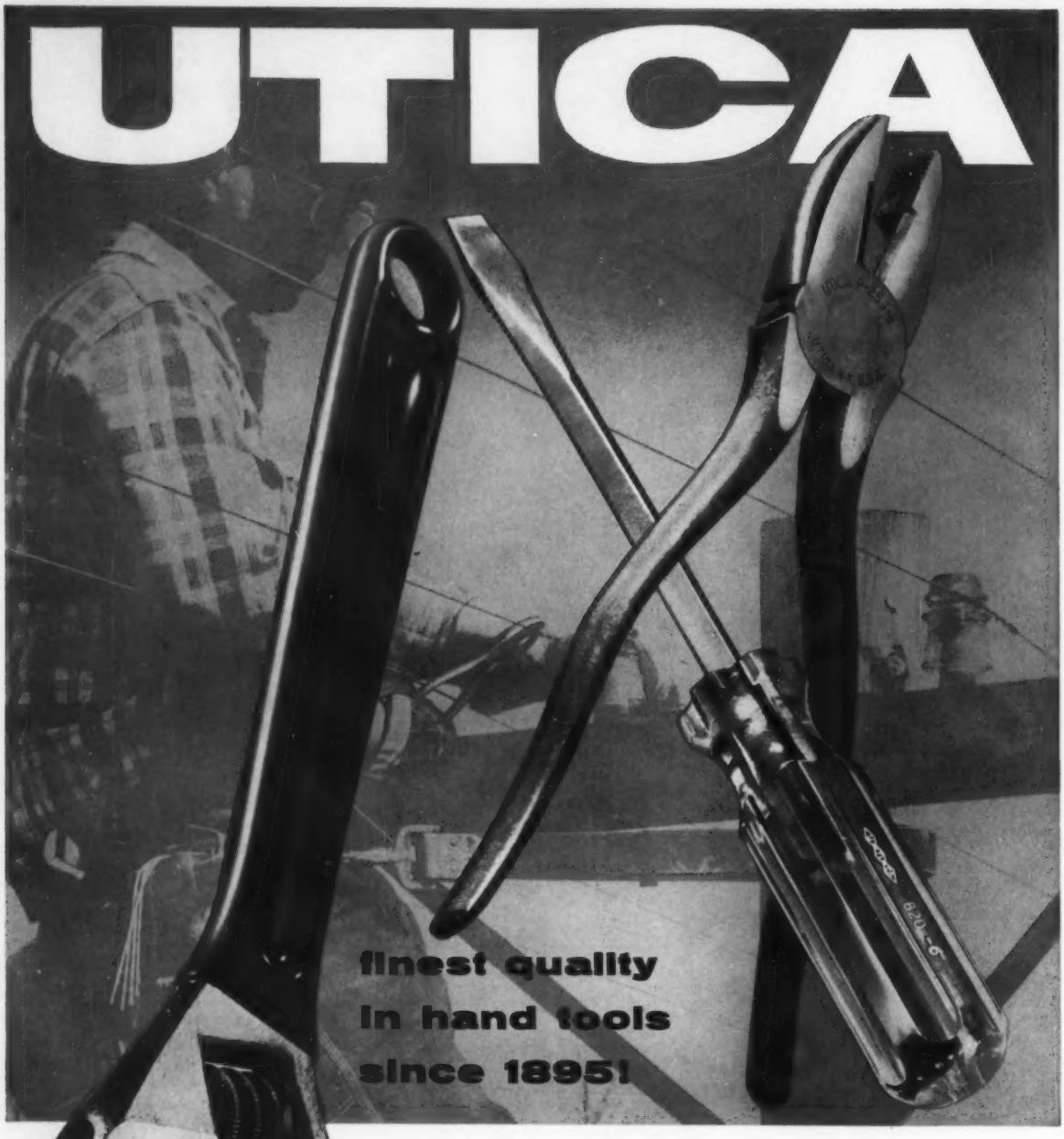

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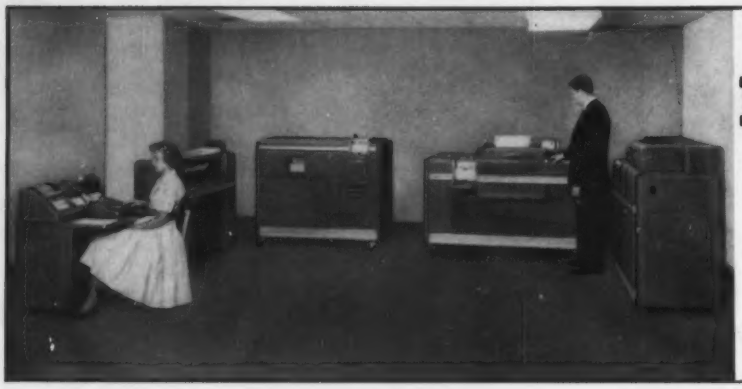

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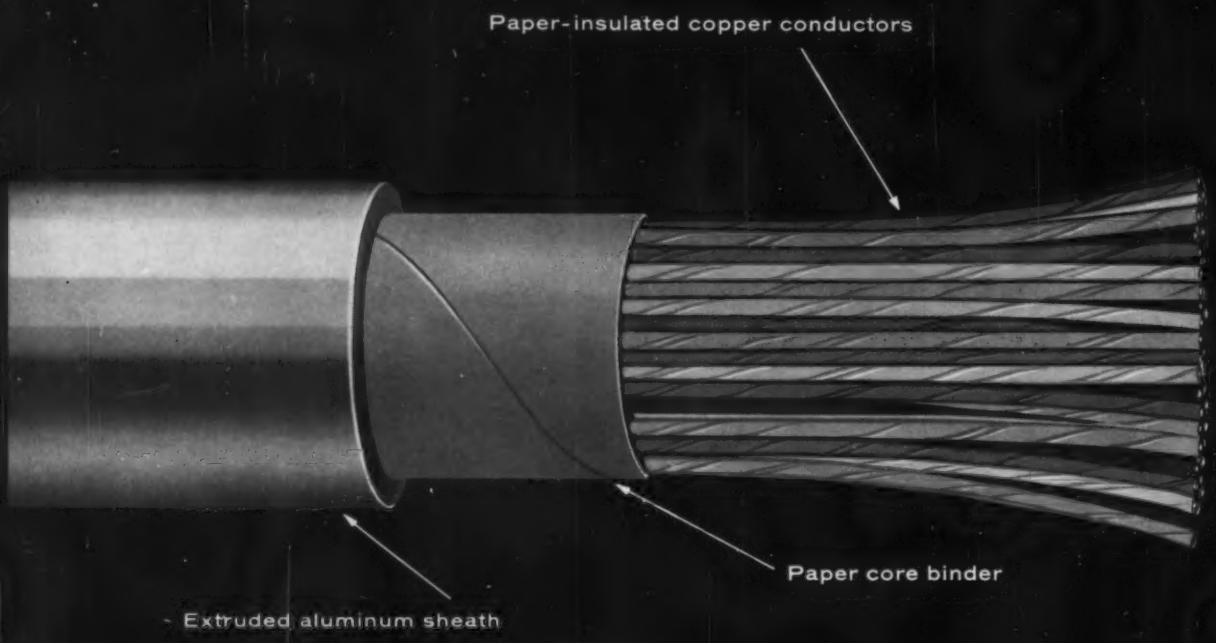

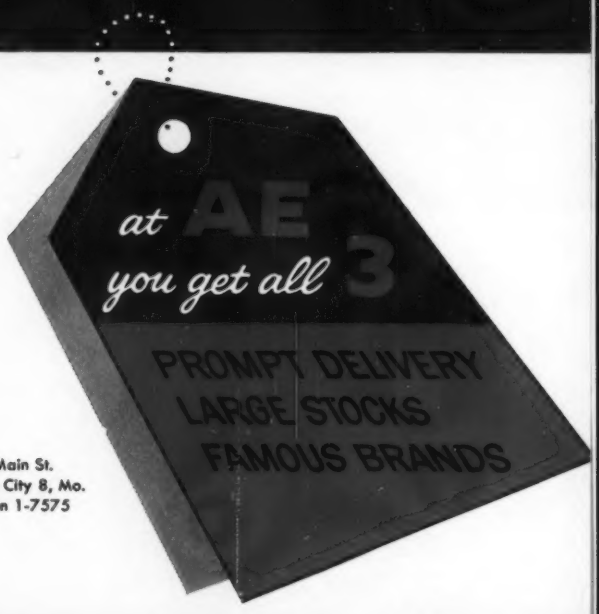

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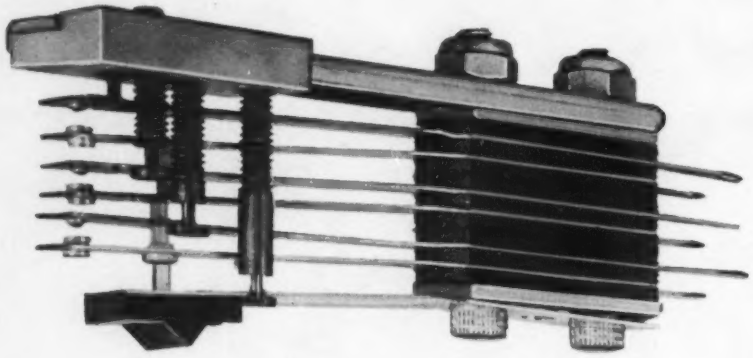

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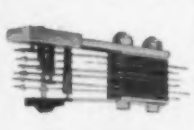
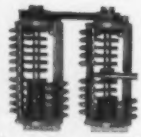


Screw adjusted pile-ups



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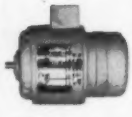

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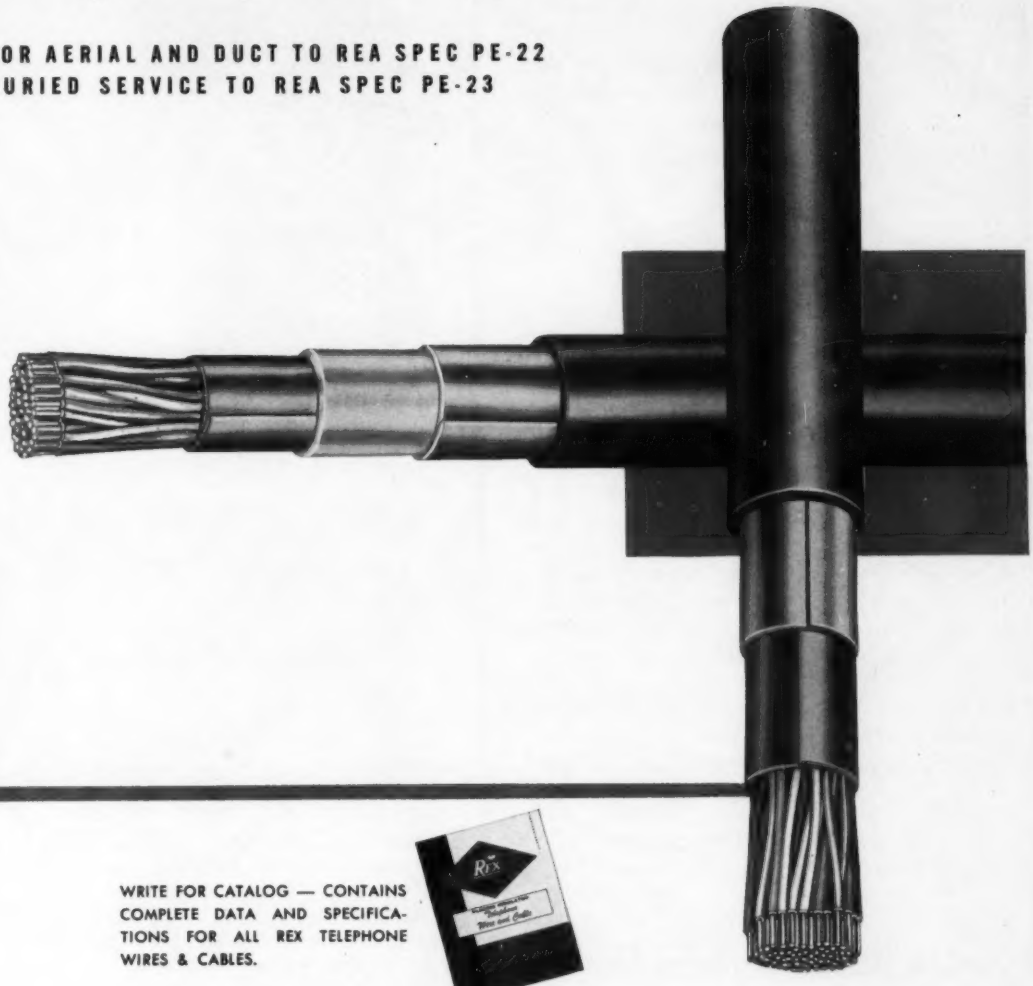

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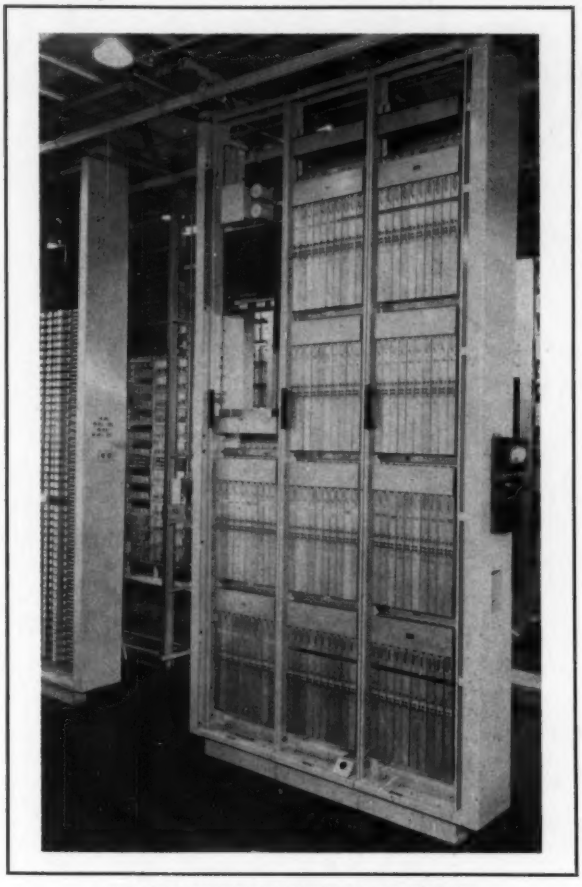

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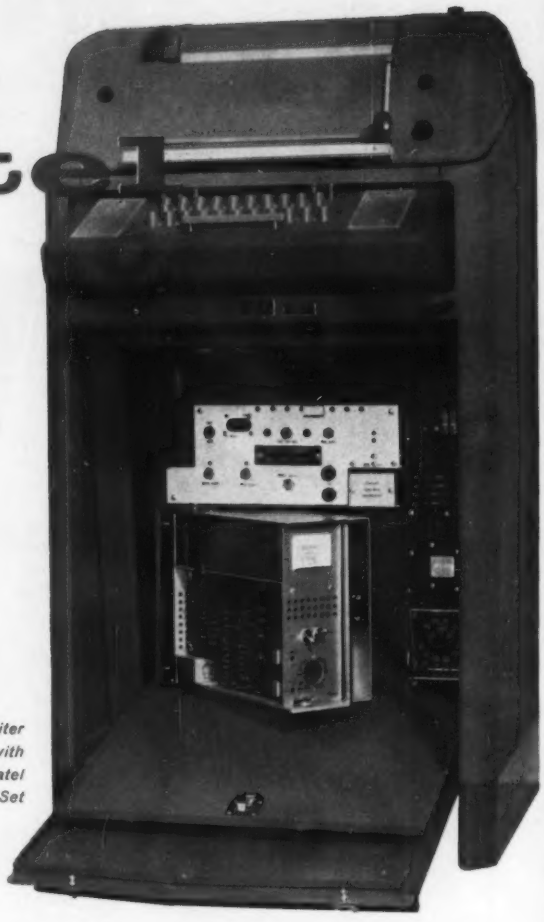

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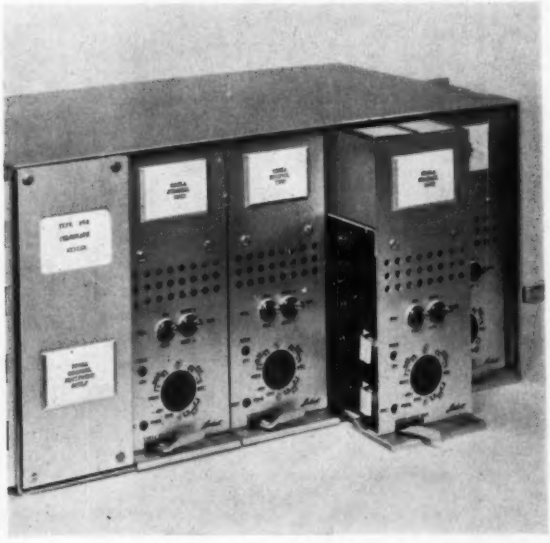

Channel equipment shelf with 4 channel units

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR
AND EDITOR, PUBLIC UTILITIES FORTNIGHTLY

FCC expands eligibility for private users of frequencies above 890 mc. . . . Summary and interpretation of FCC decisions. . . . BDSA says 1959 telephone installations approach 4 million. . . . Equipment manufacturing expected to approach 1957 levels. . . . 1959 manufacturing outlook.

THE FEDERAL Communications Commission, in a 6-to-0 action, has approved an order which could have a considerable impact on point-to-point radio-telephone operations using frequencies above 890 megacycles.

Under this order, theoretically almost anybody who may technically qualify will be permitted to apply for private point-to-point communications systems, even though common carrier service (by telephone and telegraph companies) is available.

The report states in one of its conclusions:

"The record supports the determination that there is a need for private point-to-point systems. In many cases, the operation of the private users is such that it is not convenient or practicable for common carriers to provide such service (e. g., remote or isolated business operations).

"In this connection, it may be observed that certain of the private users now licensed endeavored to get the common carriers to provide such service initially and constructed their private systems only when the carriers refused to do so. Even in areas where common carrier facilities and personnel are readily available, there appears to be a need for private systems.

"In the first place, the private users do not require, in all cases, the high quality of service provided by the carriers to meet the varied needs of the public.

"Also, such private systems would provide for better control and flexibility for meeting their own hour-by-hour operational and administrative needs.

"At the present time, under current policies, only a limited use is being made of microwave frequencies. It is our view that provision for expanded eligibility will provide for more effective frequency utilization.

"On the other hand, we believe that there are certain factors or conditions which will operate as practical deterrents to private users in establising their own systems.

"The first, and perhaps primary deterrent, is the cost involved in establishing such systems.

"Another control is that the traffic regulations of certain common carriers will operate as a limiting factor, particularly in cases where a private system is established and efforts are made to obtain interconnection with a carrier where common carrier facilities are available and the carrier would be compelled to 'short-haul' itself."

The fact that the licensing of such private systems might have an adverse effect, economically, on telephone companies in the future was not considered to be a valid reason for denying private system establishment.

Aside from the vagueness of telephone industry evidence on this point, the commission concluded: "It is abundantly clear that there is no *express* obligation on the part of the commission under the Communications Act of 1934, as amended, to protect the users of common carrier service from any adverse economic effects that the carriers might suffer in that connection."

Readers may recall that the FCC followed a somewhat different policy some years ago when it indicated that the availability of alternative common carrier service should be a factor in determining whether television broadcasters, for example, should be allowed to set up their own radio relay systems.

Well, evidently the commission has changed its mind about that. The opinion in the recent case (Docket No. 11866) says about this—as a conclusion:

"It may be noted in passing that the commission, in the past, has licensed television broadcasters to operate their own microwave relay facilities for temporary periods until common carrier facilities became available. (See the commission's report in Docket No. 6651, adopted Feb. 20, 1948, Mimeo FCC 48-481.)

"Such a policy determination that the broadcasters look to common carriers for intercity relay of television programs was predicated upon public interest considerations arising from the commission's belief at that time that there was not sufficient frequency space between 1000 and 1300 mc in the non-government fixed and mobile bands to accommodate private relay systems.

"However, as indicated previously, on the basis of the record herein, we are of the opinion that the public interest would not be served by a policy of restricting or denying the licensing of private point-to-point systems solely because common carrier facilities are available or may become available in the reasonable future. It follows that the commission should not consider the availability of common carrier facilities as a condition of eligibility for private users."

What FCC 890 mc Decision Means

In short, the commission adopted two broad overall policy determinations: (1) relating to the adequacy of the supply of microwave frequencies and the terms and extent to which radio station authorizations may be made

to private users, and (2) the other relating to the responsibility and obligation of the commission to consider the economic effects the licensing of private point-to-point communications systems would have on the common carriers, the users of common carrier service, and the general public.

The FCC opinion supports the following conclusions on these two points, respectively:

(1) There are now available adequate frequencies above 890 mc to take care of present and reasonably foreseeable future needs of both the common carriers and private users for point-to-point communications systems, provided that orderly and systematic procedures and proper technical criteria are applied in the issuance of authorizations, and that implementation is consistently achieved with respect to all available and future improvements in the art.

There is a demonstrated need for private point-to-point communications systems. Accordingly, the decision looks toward liberalization of the basis for issuance of such authorizations. Availability of common carrier facilities will not be considered as a condition of eligibility for such private users.

(2) There is no basis for generally concluding that the licensing of private communications systems would adversely affect, to any substantial degree, the ability of common carriers to provide service to the general public or adversely affect the users of such common carrier service.

Therefore, it is unnecessary to consider whether such licensing is contrary to the public interest.

The commission emphasized, however, that it has not determined that there are unlimited frequencies available or that future conditions may not require that limitations and restrictions be placed upon such authorizations and operations. It was further stated that the FCC plans to watch this matter very carefully and, if future conditions so indicate, to take whatever corrective action may be deemed appropriate at that time.

In summary, other determinations made in the FCC's report and order are: Since frequencies about 10,000 mc are suitable for intracity or local area operations, as a general principle, it will be expected that all such operations will be conducted on these frequencies.

In so far as private services (excluding broadcasters) are concerned, except for public safety organizations and for control and repeater operations, future authorizations for private intracity or local area point-to-point operations will be granted only on frequencies above 10,000 mc, including point-to-point operations in the business radio service.

Similar authorizations in the citizens' radio service will be made on frequencies 16,000 mc and above. Use of frequencies above 30,000 mc will be on a developmental basis.

Authorizations for the co-operative use of private microwave systems will not be issued except for (1) persons eligible in the police, fire, highway maintenance, local government, and forestry conservation radio services; (2) the so-called right-of-way companies, like pipelines and railroads; and (3) other organizations whose rates and charges are regulated by a governmental entity.

These exceptions are justified (1) in order to afford the FCC a good basis upon which to make meaningful observations as to the desirability and impact of such arrangements, and (2) because it is evident that any economic benefits flowing out of such arrangements will assuredly flow directly back to the public, either as taxpayers or rate payers.

Tropospheric forward scatter systems will generally not be authorized between points in the continental limits of the United States, excluding the state of Alaska, since it does not appear that joint occupancy of frequency bands by tropospheric forward scatter systems and conventional line-of-sight systems is generally practicable.

The bank 6,425-6,575 mc is proposed for allocation (after the International Radio Conference now going on in Geneva, Switzerland) as follows: 6,425-6,525 mc to common carriers for mobile operations such as video pickups for broadcasters, closed loop television, aeronautical or maritime public correspondence, etc., and 6,525-6,575 mc to noncommon carrier (excluding broadcasters) mobile operations, such as police video, etc.

The band 10,550-10,700 mc is proposed for allocation to private users (excluding broadcasters) for mobile operations, and the band 11,700-12,200 mc for allocation to common carriers for mobile operations as in the band 6,425-6,525 mc.

Sharing of frequency bands by common carriers and private users, except in very limited circumstances, is neither feasible nor desirable.

Omnidirectional antenna systems would substantially curtail the use of microwave frequencies, but since there appears to be some need for them by public safety organizations, authorizations for such systems will be made on a case-by-case basis in the bands above 16,000 mc.

Convention Calendar

1959

Association	*Date*	*City*	*Hotel*
Tennessee	Sept. 9 and 10	Nashville	Hermitage
Arkansas	Sept. 14 and 15	Hot Springs	Arlington
Michigan	Sept. 16 and 17	Grand Rapids	Pantlind
Rocky Mountain	Sept. 16, 17 and 18	Salt Lake City, Utah	Utah
New England	Sept. 21, 22 and 23	Bretton Woods, N.H.	Mt. Washington
West Virginia	Sept. 23 and 24	Davis	Blackwater Falls Lodge
Nevada	Sept. 23, 24, and 25	Elko	Stockmen's
North Carolina	Oct. 4, 5, 6 and 7	Pinehurst	Carolina
Alaska	Oct. 5, 6 and 7	Anchorage	Contact: H. R. Zinns P. O. Box 400, Anchorage
USITA Annual Convention	Oct 11, 12, 13 and 14	Chicago	Conrad Hilton
South Carolina	Oct. 25, 26 and 27	Clemson	Clemson House
Virginia	Oct. 29 and 30	Roanoke	Roanoke
Alabama	Nov. 9 and 10	Birmingham	Thomas Jefferson
Georgia	Nov. 11 and 12	Atlanta	Dinkler-Plaza
Oklahoma	Nov. 18 and 19	Oklahoma City	Skirvin
South Dakota	Nov. 18 and 19	Huron	Marvin-Hughitt
Florida	Nov. 30 and Dec. 1	Jacksonville	Robert Meyer

*Joint Convention

Telephone Trends for 1959

The results of a survey by the Business & Defense Services Administration (BDSA) of the U. S. Department of

(Please turn to page 45)

A B C of the Telephone

by Frank E. Lee

NEW IDEAS and new developments have been creating considerable interest in the telephone industry for the past few years. At first glance a person would be led to believe that old ideas and concepts should be disregarded and only new ideas should be put to use in the telephone plant. This sounds rather drastic and a bit foolhardy, but it is a natural reaction to the glamor of things that are labelled new.

This certainly isn't an attempt to play down or discount the value of an idea or a development just because it is new. Still, on the other hand, an old idea or concept never should be discarded or relegated to a minor role just because it has been around and has been doing a good job for a long time. Consider open wire lines as an excellent example.

Over the past few years the outside plant has been improved in many ways. New types of cable have been developed and put to excellent use. The concept of buried cable has been explored and considerable progress has been made in the application. Various types of urban and rural multi-pair distribution wire have been developed.

These are all good ideas and have broad application in the telephone plant. Nevertheless, individually or as a group, these new developments are not sufficient cause to disregard the use of open wire lines where they are economically advantageous in the telephone plant.

Significant developments have also taken place in the open wire field. Higher strength wire has enabled engineers to design open wire lines with longer spans. New, inexpensive spacers are available to prevent tangling or twisting of wires in the longer spans. Any of a number of dampers can be used to effectively control vibration.

New line wire ties have been developed. These ties are easy to install and they hold the wire with a positive grip. This is a big advantage if for some reason a line wire should break. Generally the wire will not slack off or loosen in spans on either side of the break. This simplifies maintenance and reduces the cost of the line.

New splicing techniques, simplified dead ends, and improved transposition patterns to further improve the excellent transmission of open wire lines are typical of other improvements that have been made in the open wire construction field.

Part 89. OUTSIDE PLANT CONSTRUCTION—Section 15. Open wire lines in the telephone plant.

Section 1. Planning of additions to outside plant (TELEPHONY, Nov. 17, 1956).

Section 2. Laying out the pole line, clearances to be maintained, and grading requirements (TELEPHONY, Nov. 24, 1956).

Section 3. Selection, treatment, handling, storage, and gaining of poles (TELEPHONY, Dec. 1, 1956).

Section 4. Items of power equipment used in pole line construction and maintenance. Also discussed are depth poles set in various types of soil (TELEPHONY, Dec. 8, 1956).

Section 5. Purpose of guy wires and factors involved in their proper placement (TELEPHONY, Feb. 16, 1957).

Section 6. Types of guy wires, how to determine guy loads, and the selection of guy strand (TELEPHONY, Feb. 23, 1957).

Section 7. Selection and installation of anchors (TELEPHONY, Apr. 27, 1957).

Section 8. Selection and installation of anchors—continued (TELEPHONY, May 4, 1957).

Section 9. Installation of new cable facilities—lead and plastic (TELEPHONY, Sept. 14, 1957).

Section 10. Installation of new cable facilities—lead and plastic (TELEPHONY, Mar. 8, 1958).

Section 11. Methods used to fasten aerial cable to messenger strand (TELEPHONY, Aug. 9, 1958).

Section 12. Methods used to fasten aerial cable to messenger strand —continued (TELEPHONY, Aug. 16, 1958).

Section 13. Application of lashing rods, lashed cable supports, and typical aerial cable arrangements (TELEPHONY, Apr. 25, 1959).

Section 14. Self-supporting cable and wiring at aerial cable terminals (TELEPHONY, May 2, 1959).

Actually, new developments have rejuvenated open wire lines which, for the first 80 years of their history, literally have been the workhorse of the telephone industry. Today, open wire lines, under many conditions, are still highly competitive and are the best choice of outside plant for many applications.

Additional details on the new developments that have improved the performance of open wire lines are as follows:

High Strength Line Wires

The selection of conductors for open wire lines must involve consideration of the type of line, the importance of the service and the electrical and mechanical requirements. The line must meet electrical requirements to maintain the desired level of transmission. As a general rule, a conductor should be selected that is suitable for carrier circuit operation. This is especially true of short or long-haul toll lines and similar lines used as interoffice or intercity trunks.

Electrical considerations are also important on long subscriber lines. Selection of the proper line wires helps provide good transmission and good ringing or signalling on these circuits.

Considerable progress has been made in the past few years in the development of high strength line wires with low transmission loss. Included in this group are new ferrous wires made of new types of steel with special-process treatments during manufacture and new high strength, copper-jacketed steel wires. The transmission efficiency of these wires at voice and carrier frequency levels has been improved considerably over that of older-type line wires.

Perhaps the most important advantage of the new line wires is their high mechanical strength. At first glance a person might think that any wire could be hung on a pole line and be strong enough to last a number of years. However, this is not the case.

Stress Factors

The stress placed on an open wire span is considerably more than the weight of the wire used in the span. For example, the wire in a 350-foot span may weigh only 10.5 pounds. A typical wire often used for this span has a breaking strength of 1325 pounds. This is more than 126 times greater than the weight of the wire alone!

The answer to why such a strong wire is used for these spans is a combination of factors as follows:

(1) The tension applied to the span as it is pulled up to the proper sag. This provides the necessary ground clearance and at the same time permits use of relatively short poles.

(2) The effect of the pull of gravity on a span increases many, many times as the wire approaches the line of sight between the supports on the poles at both ends of the span. This greatly increased gravitational load becomes a horizontal load added to the load-carrying capabilities of the wire. This might be explained by the increased tension required to pull the wire up to a straight line or line of sight position. However, the greater tension is needed to overcome the pull of gravity exerted against every inch of wire suspended in the span.

Allowances must be made for this law of physics in the design of open wire spans, or, for that matter, for any type span used in the telephone plant. the longer the span, the greater the sag and thus, less proportional overall tension or load placed on the line wire.

(3) Additional stresses on open wire spans are caused by wind pressure and by the weight of snow or ice that may accumulate on the wire.

After all of these loads have been evaluated and added together, the new line wires designed for long-span construction still have a substantial safety factor. This means the new wires can be used safely in any of the three loading areas—heavy, medium, and light.

Long-Span Advantages

Longer spans of open wire have many important advantages to the telephone operating company. First is the cost of installation.

The use of longer spans means a saving on poles in each mile of line, as illustrated in *Fig. 1.* A reduction in the number of poles adds up to worthwhile savings when the following factors are considered.

(1) Savings in the cost of poles and pole hardware.

(2) Savings in installation cost.

(3) Simplified routing and staking of the pole line.

Second, is reduced maintenance expense. Modern open wire lines require less maintenance than lines built as recently as four or five years ago. The new high strength wires seldom break —even under the stress of the most severe storms. If trouble does occur, the lines are open to view and the trouble can be located easily and repaired quickly.

This is quite different from what might be expected of an older-type open wire line after being subjected to a severe storm. The older wires, with less tensile strength would have a tendency to stretch and break under abnormal stress. Once a break occurred, the line would loosen for many spans adjacent to the span in which a break occurred. This would add to the maintenance effort required to restore the various circuits to service.

When all factors are considered, longer spans can easily result in savings of from 20 per cent to 35 per cent in open wire construction costs. Savings in construction costs are important to the operating company because this amounts to a direct savings in capital investment. This means that more

(Please turn to page 49)

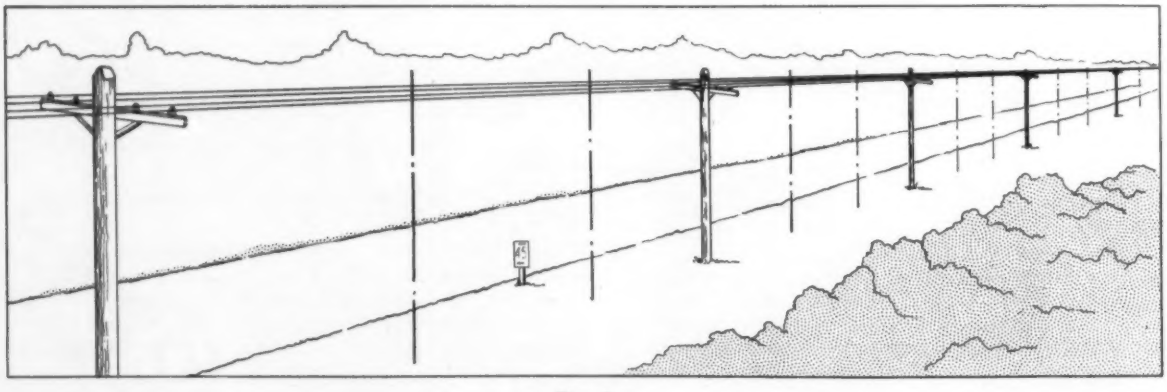


Fig. 1.

Graduates urged to —

DEVELOP FULL POTENTIAL

by HELEN HARDIN

RECENT commencement scenes across the United States bring to mind the tradition-bound commencement speaker, who, too often, has been content to give the graduate a pat on the back and a few hints concerning the tough world he or she is about to enter.

When a speaker breaks with this trite pattern, and inspires, and challenges with a message that gives the graduate, and perhaps, his elders, something for fulfillment, it is indeed news.

The editors of TELEPHONY have come across two such challenging messages, one in the commencement address delivered June 1 at Knox College, Galesburg, Ill., by Frederick R. Kappel, president of the American Telephone & Telegraph Co.; the other, an annual report to Carnegie Corp. of New York by its president, John W. Gardner.

We present excerpts from the two imaginative positions on education which we feel will doubtless provide ideas to spark talks by men of various fields, including telephony, when they address audiences, not only in ivy halls, but whenever and wherever they may feel impelled to take up the cause of education for the fulfillment of the individual.

Personally aware that today's graduate expects more from a commencement speaker than platitudes, Frederick R. Kappel began his commencement address at Knox College by talking about awareness, specifically, of the bigness of today's world.

As though he heard the complaint voiced by a 1959 Culver-Stockton College (Canton, Mo.) graduate that society in its "fear, suspicion, insecurity, uncertainty, bigness, and mass organization has forgotten the individual," Mr. Kappel said, "The bigger the world, or more precisely, the bigger your apprehension of it, the more room it gives you to grow in."

Acknowledging that talents differ, but reminding the graduates that the waste of none can be easily afforded, he continued, "I am expressing the old-fashioned prayer of every commencement speaker —that you will travel all the ground, in thought and action, that your particular endowments will allow."

Into just what kind of world is the graduate going? What types of challenges may he expect to find?

According to Mr. Kappel, today there is the world situation of strength and determination of the communist states . . . the ferment of peoples in territories and new nations striving for a better life . . . it is a time of speed and technological change, and of the awful knowledge that the world possesses "a power for destruction so great it challenges description."

Making Democracy Work

Under these conditions, will democracy and free society maintain itself and grow? Mr. Kappel answered the graduates' questions at Galesburg thus:

". . . no more than anything else can freedom stand still; it will either grow, or wither. And, even in less critical times, making democracy work has been a difficult and delicate matter.

"For freedom encourages differences of all kinds; differences of ideas, of tastes, of ambitions, of personal goals. We don't want to be shaped or formed according to some standard model. We want to disagree and argue with each other . . . We stand on our rights and stick up for our opinions. We want the air of freedom and we don't want it air-conditioned by somebody else.

"These are fine principles and they lead us into many kinds of good. The competition of people who feel themselves free puts a tremendous energy to work. We are invigorated and encouraged to explore, invent, and innovate. By pursuing different goals we get a rich variety of results.

"And the process of debate opens our minds to the ideas of others. The give and take of freedom stirs up thinking and uncovers talents that would otherwise never come to life."

Individual Lives Nourish

Warning his young audience of the danger of taking freedom for granted —listening to what we like to hear, and shutting our ears to the rest—Mr. Kappel said—

"I think it comes down to this . . . making democracy work depends on the quality of individual lives, and on how they nourish each other. It depends on people developing themselves with the idea of contributing something, and not just taking something.

"It depends on their eagerness to exercise their personal talents, and their personal tastes, in ways that enrich the common life.

"It depends on their interest in helping to bring out the best in other people.

"It depends on vigorous and thoughtful participation in political life.

"It depends on capacity for self-discipline—by which I mean . . . the kind of discipline that people with worth-while goals happily impose on themselves."

Mr. Kappel attacked the question of personal interest in, and desire for, material rewards by admitting that the

drive for material rewards is very strong. He added that material gains do contribute to social gains but said that "civilized people have to temper their self-interest."

The 1959 graduate of Culver-Stockton looked at the viewpoint of college students today, saying: "A great majority have self-centered ideas, with materialistic values and gratifications —They are students searching for their place in the status quo, on the assembly line. No urgent need to pioneer, to break forth as the alpha; but acceptance of society as it is."

But Mr. Kappel would spur the graduate toward a broader concern, saying: "We have to have an educated, intelligent, thoughtful balance of interest; regard for other people as individuals; personal concern for the common welfare; devotion—and I will say, *dedication, to something beyond ourselves.*"

We are striving toward perfection in solving technical problems, but as Mr. Kappel sees it, it is even more important, and perhaps, hardest of all, to solve the human problems, the more so because here we cannot measure results, or discover the mistakes, with a ruler or stop-watch.

The Organization Man

Decrying the popular notion of the "organization man" type, Mr. Kappel said that in a complex organization, thousands of individual decisions are called for, decisions which he termed "never petty, but influential to the whole" of the organization.

He told the Knox graduates that there *is* room for the individual. He believes that those thinking of entering a large company (the organization) should do so with the thought of having a share in its purposes, of helping to make those purposes, rather than of merely following them. He presented the challenge of the large company briefly:

"To help make an organization's purposes calls for much more effort on your part to develop your capacities and your competence . . . The freedom to be a maker, like all other freedoms, depends on your fitness for it, and this fitness does not come of itself. It has to be created."

Responsibility in Politics

"I hope some of you will go into politics, and I hope all of you will take politics seriously, urged Mr. Kappel.

"Legislators in a democratic country face a very, very difficult problem—they cannot dissociate themselves from the views of their constituents.

"Yet what are our views? And how thoughtful are they?

"If they are narrow and provincial, and do not take into account the serious problems that confront the whole country, then our lawmakers have no help in making crucial decisions that affect the welfare of all. In plain language, *if we think small, how can we expect them to act big?*"

Quoting Jefferson's well-known advice that "eternal vigilance is the price of liberty" Mr. Kappel qualified the statement, saying this means not merely military watchfulness. "The times we live in ask more of us than that. They ask us to *become better informed, better educated, more diligent, more responsible, more earnest, more wise,*" he said.

The Support of Freedom

In conclusion, said the head of AT&T quoting from Tom Paine: " 'Those who expect to reap the blessings of freedom must, like men, undergo the fatigue of supporting it.' "

Self-discipline, self-improvement, contributing to others, to the country as a whole, developing the capacity to give, rather than to take—these are the goals of a life-long program of individual development through education, in one form or another, as Mr. Kappel sees them.

He is not alone among speakers in sensing the need for growth beyond formal education for the good of the individual human being and for the freedom he enjoys.

The responsibilities of supporting freedom are being discussed today, too, in the observations by other American industrial observers, many of whom have visited in Russia.

Harold Mansfield, for example, who saw the educational program of the USSR in practice, reminded us in his article "Our Red Rivals," (TELEPHONY, May 16, May 23) that Americans must replace self-interest with self-discipline, and complacency with competition.

A TELEPHONY reader in a recent letter, commenting on Mr. Mansfield's article, remarked upon the Russian's "exceptional spiritual drive in improving not so much himself as the entire way of life for his country."

Servant Of All Our Purposes

John W. Gardner states the premise, gleaned from his 1958 Carnegie Corp. report, that education is "of central importance itself and the servant of all our other purposes."

Emphatically Mr. Gardner states, "our beliefs about the individual and the importance of his fulfillment must now be universally explored and understood.

"Society's larger task," he says, "should aid the individual's intellectual, emotional and moral growth . . . What we must reach for is a conception of perpetual self-discovery, perpetual reshaping to realize one's goals, to realize one's best self, to be the person one could be."

Like Mr. Kappel, Mr. Gardner deplores the waste of human resources. The fact that large numbers of American boys and girls fail to attain their full development, he believes, must weigh heavily on our national conscience. He said:

"And it is not simply a loss to the individual. At a time when the nation must make the most of its human resources, it is unthinkable that we should resign ourselves to this waste of potentialities. Recent events have taught us . . . that our strength, creativity, and further growth as a society depend upon our capacity to develop the talents and potentialities of our people."

The Culver-Stockton College graduate knows that each student "needs recognition for his individual merit, for it is there," she says, "that he finds his encouragement, satisfaction and education."

Beyond Formal Education

But the graduate is not alone in this knowledge. There have been some beginnings in education "beyond formal education."

They have been made in the U. S., Mr. Gardner points out, in some degree, in the home, the church, on the playground, and by institutions that shape the individual, such as child welfare organizations, adoption services and foundlings' homes, in hospitals and in clinics, and elsewhere.

Religious groups, libraries, museums, adult education programs have helped.

Mr. Gardner wishes such media as radio, moving pictures, and television, which he feels have not begun to touch upon the possibilities for individual development, would set up some long-term services in this area.

He would enlist newspapers and magazines in the over-all program, too.

He feels that but a small percentage of book publishers have, as yet, become seriously interested.

Serious pursuit of the goal of individual fulfillment will extend, also, he believes, to unions, lodges and professional groups and, eventually, even to social groups.

As for industry and business, says Mr. Gardner: "There are innumerable opportunities open to the employer who is willing to acknowledge his responsibility for furthering the individual development of the men and women in his employ.

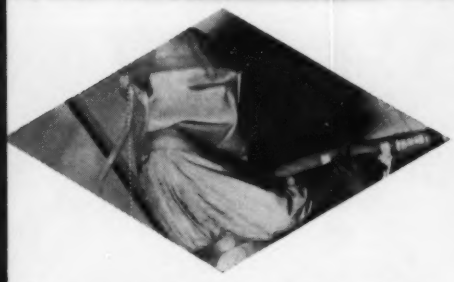
(Please turn to page 54)

Can You Guess Who Is Working for You?

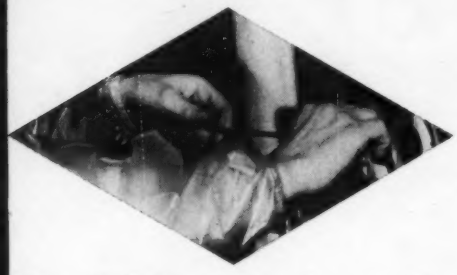
PICTURES sometimes can be deceiving. Everyday operations — those taken for granted by the typical telephone company, or by a manufacturer, such as Stromberg-Carlson—when viewed from a different angle or slightly out of context, can take on new interpretations . . . but only for a moment.

But we should not lose sight of the fact that just as most typical operations for a telephone company are accomplished by the average front-line employee, so too are the less spectacular — but important — roles of production at Stromberg-Carlson performed by men and women who do their jobs exceptionally well in making the products used by the typical operating company employee.

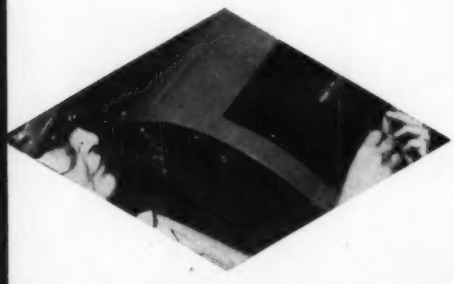
We could have used the standard cliches such as: "Shoulder to shoulder," "We're all in the same boat," "The best kind of pull is when we are pulling together," "Hand in hand"—to describe the feeling of teamwork between Stromberg-Carlson and your company, but we thought you deserved more than that. Instead, our photographer took some unusual production shots, selected photos from our customer photo file . . . and our imagination went wild. Now it's time to stir your imagination—have some fun—and try to guess "who it is that's working for you." Then turn the page to learn how right you are.



Space researcher? . . . . We're doing that, too, at Stromberg-Carlson.



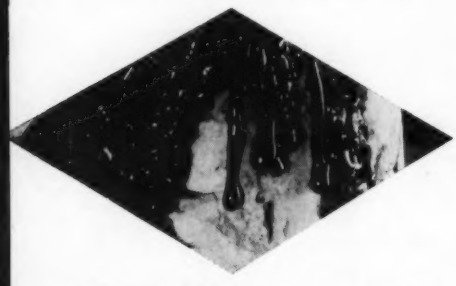
Nice clean job . . . . and now we'll put it up to dry.



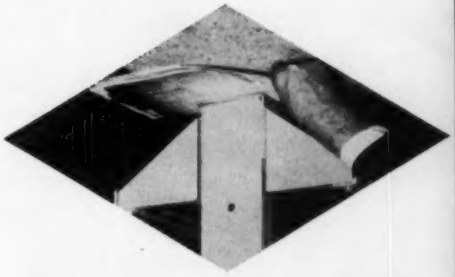
Process is repeated every 20 seconds . . . . and a perfect piece every time.

Daring young man on a flying trapeze? . . . . Not quite.

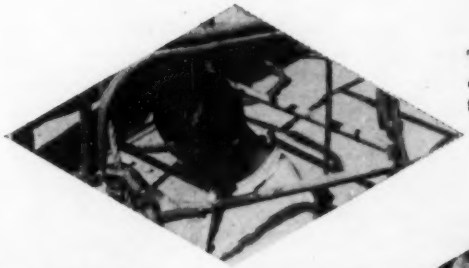
Birdwatcher? Maybe . . . . but what he's watching is not for the birds.



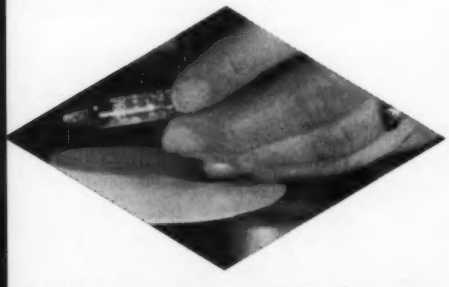
Couldn't resist this one . . . . hot but it's not fudge.



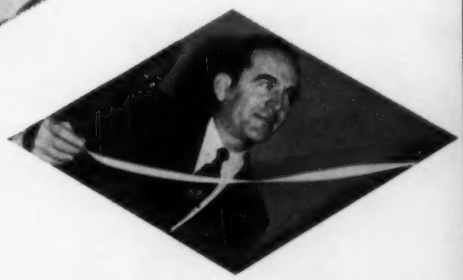
Tight fit . . . . try this upside down . . . any way you look at it, the solution was well supported.



Doing time? . . . . It's one way to get to the bottom of things.



Another step towards built-in quality . . . . feeding time? No, but after this it's ready to glow.



Finally the blue ribbon day.

Please turn page for answers.

In case you haven't already guessed . . .

At Stromberg-Carlson raw metal stock undergoes sand blasting, before being painted, to remove rust and scale and protect metal from internal rusting. While framework is being painted . . . .

small parts are given that special touch. Stromberg-Carlson's Plating Department processes thousands of parts, large and small, automatically and manually, every day. For the inside touch . . . .

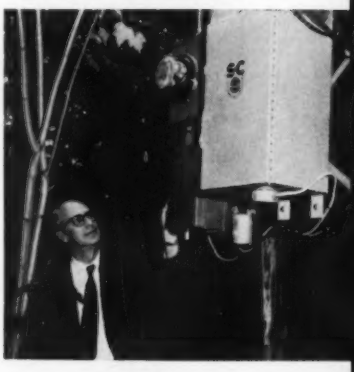
there is the Brush-O-Matic. In just 20 seconds this machine deburrs and cleans the cog roller for the XY® Universal Switch . . . . assuring a smooth operating switch. Really getting the inside treatment . . . .

is this coil and capacitor container. Encapsulating material being poured into the outer shell is used for protection against wetness and variations in temperature and finally . . . .

inspection and tests . . . . All incoming materials and outgoing products undergo rigid inspection insuring a quality product. Of course, the work may be just starting . . . .

for our customers . . . . like this busy cable splicer in his cable sling. Dial conversion, extended service or normal routine maintenance always means work for the man on the pole as well as . . . .

the underground installer. Their jobs never end and neither does the demand for more service. The expansion of suburbia has made it necessary to find faster and more economical ways to provide additional telephone service. Many have already found that . . . .



561 Subscriber Carrier has been the perfect answer for providing temporary or permanent expansion of telephone service. Stromberg-Carlson Carrier systems make full use of existing facilities. Once in a great while . . . .

we are faced with the unusual. In this case a complete XY Dial System was suspended from the ceiling to remove pressure on a supporting floor. The successful solution to this installation problem represents the combined efforts of customer and manufacturer . . . .

bringing quality services and products together. Result: another successful cutover.

As a PR Man Views the Telephone INDUSTRY

By S. W. PHILLIPS*

Excerpt from "The Blind Men and the Elephant"—By John G. Saxe

It was six men of Indostan
To learning much inclined,
Who went to see the elephant
(Though all of them were blind).
That each by observation
Might satisfy his mind.

The first approached the elephant,
And, happening to fall
Against his broad and sturdy side,
At once began to bawl,
"God bless me! But the elephant
Is very like a wall!"

The second feeling of the tusk
Cried: "Ho! What have we here
So very round and smooth and sharp?
To me 'tis mighty clear
This wonder of an elephant
Is very like a spear!"

The third approaching the animal,
And, happening to take
The squirming trunk within his hands,
Thus boldly up and spake:
"I see," quoth he, "the elephant,
Is very like a snake!"

The fourth reached out his eager hand,
And felt about the knee:
"What most this wondrous beast is like
Is mighty plain," quoth he:
'Tis clear enough—the elephant,
Is very like a tree."

The fifth, who chanced to touch the ear,
Said: "E'en the blindest man can tell
What this resembles most.
Deny the fact who can,
This marvel of an elephant
Is very like a fan."

The sixth no sooner had begun
About the beast to grope,
Then, seizing on the swinging tail
That fell within his scope,
"I see," quoth he, "the elephant
Is very like a rope."

And so these men of Indostan
Disputed loud and long,
Each in his own opinion
Exceeding stiff and strong,
Thought each was partly in the right,
And all were in the wrong.

WITH apologies, of course, for making comparison, but do the results of the observations of the six blind men of Indostan remind you of the opinions that many of our customers get as a result of contact with telephone companies?

The title, "A Public Relations Man Views The Telephone Business," is clearly an invitation to express some opinions and draw conclusions about the public relations of our telephone industry. This I intend to do. But, in so doing, there is the risk of misunderstanding my intentions, because opinions and conclusions invariably involve criticism. But, please remember, these suggestions are offered in a spirit of friendship and with the hope that what is said will be helpful.

Remember, too, please that I am not an outsider. My present and future are intimately a part of this business and, therefore, what is to be said cannot be clinically objective. Rather, I think I can make these comments because I have the highest esteem for the men and women that make up the telephone business, because I've learned to appreciate the vital character of telephone service, because I am somewhat

*Mr. Phillips is Erie Division Manager of General Telephone Co. of Pennsylvania. This talk was given at the recent Pennsylvania Independent Telephone Association Convention.

familiar with the working and problems of the business, and because I am thoroughly convinced that the broad majority of our publics are willing—even anxious—to help us achieve a favorable climate of public opinion.

Most telephone people simply do not appreciate that the public does not understand the telephone business. This is true, even though I know of no business that has as many favorable opportunities to inform its customers about its operations, nor do I know of any other business that needs public understanding more than does our business.

The very nature of the telephone business—of this regulated enterprise—begs for public understanding. The vital character of this communications system makes lack of public understanding almost inexcusable on our part, because favorable public opinion—an inevitable result of public understanding—makes it easier for us to secure rights-of-way, build pole lines, establish central office buildings, maintain plant, meet emergency or disaster conditions, hire the right kind of employes, collect bills, sell our securities, install service, compete for the consumers' spendable dollars, reprice our service when necessary, and, generally, conduct our business affairs more easily—and effectively. And, yet, most telephone people simply do not appreciate that the public does not understand our business.

Start With The Top

Now, who are we talking about when we say "telephone people." Well, let's start at the top—the chief executive. Here is where the keynote is sounded for your entire company. The attitudes and actions of the top men of management set the pattern and determine the course that will be followed by all other employes. The greatest problem here, it seems to me, is that lip service is given to the importance of building good public understanding without the follow-through—without a continuous, conscientious effort being made to effectively create understanding. We simply cannot buy the public's favor when we want it. We simply cannot expect the public's support and understanding by seeking it only upon those occasions when we need it.

Instead, public support comes as a result of a determined effort by the company to *earn* it—comes as a result of *working* for it through a year-round program of public information based on a foundation of good telephone service, enlightened and progressive company policy as it relates to the public, and by using modern public relations methods and techniques.

S. W. PHILLIPS

As I said earlier, I am convinced that we have a great ally in the fact that the public *is interested in the telephone business* and, yes, is even *anxious to help us achieve a favorable climate of public opinion.*

Go out into your business office and talk informally to some of your customers. Make it a point to discuss telephone affairs, take them down to your cable vault, take them through your equipment rooms and anywhere else in your operation, and I'll bet you a good Stetson hat that they will—

(1) Be extremely interested.
(2) Express amazement at your operations.
(3) Thank you for giving them a look at the telephone business.

And, you will have made a friend for your company. This will tell you something important—that you should project this simple action in creating better public understanding to a continuous well-rounded, well-defined program, using *all of your employes* in the effort.

Try To Calculate Value

Try to calculate the good that such a program will generate for your company. Consider almost every customer contact as an opportunity—an important opportunity to create a better understanding of your company's problems and activities—and then try to put a value on the results. This effort envisions actions ranging from (1) the attitude of a cashier taking payment of bills, to the lineman handling tools and equipment on customers' premises; (2) from a service representative taking an order for service, to an installer chatting with a customer while working in his home; (3) from a company representative making a speech in a service club, to a billing clerk discussing the company over her backyard fence with a neighbor; (4) from a right-of-way man talking to a farmer, to a line truck being driven through heavy downtown traffic.

Suppose all of these—and the many other community contacts that take place every day—were made by *well-informed enthusiastic employes.* They certainly would result in customers and the public, in general, getting a more complete picture and understanding of a telephone company—and, unlike the blind men from Indostan—they would have a basis for favorable agreement on the subject of the company, its operations, and the service supplied.

And, *the boss is the most important key.* The boss *must be sold* on the value of this approach, the boss *must direct that such a program be developed,* the boss *must be willing to invest time and money* in order to make the plan work, and the boss *must set the example* and insist on the follow-through.

When we speak of a well-informed, enthusiastic employe, what do we mean? For an employe to be well-informed, I have reference to his basic understanding of the importance of his particular job. He should have a grasp of the organizational structure of his company, understand the functions of the various departments and how his own department, section, and job contributes to the ability of the company to function.

Maintain Good Service

This, in turn, calls for an appreciation of the importance of telephone service. The quality of service is the principal factor influencing the public's opinion of the company, and the employe must not only recognize this, but must see the responsibility he has to provide and maintain good service. The employe must have confidence in the management's ability to properly direct the company's cause.

The employe craves orientation. He needs to know where he stands in the opinion of his supervisor. He wants to know how his job performance ranks—is he doing a good job, how can he improve, and is there opportunity for advancement?

Now, this is not a discussion on employer-employe relations, however, the public relations value of employes is determined in large measure by how well the company develops in its people the desire to do a good job. And, the employes' desire to do a good job is determined by such factors I have mentioned and more like them. You simply do not turn on a "public relations

(Please turn to page 52)

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

WE MENTIONED the advantages of loading telephone circuits on this page in the May 30 issue. We now have a letter from Mr. R. L. Rayner, transmission maintenance engineer for the Michigan Bell Telephone Co., in which he makes the following comments on loading and its effects on crosstalk:

"Loading is a process by which voice frequency impedance is increased. Increased impedance for a given amount of power means increased voltage and decreased current. The decreased current results in less $I^2 R$ loss and, therefore, there is less attenuation to voice frequency currents.

"Crosstalk in cable usually results from capacitance between the disturbing and disturbed pairs. For a given amount of capacitance unbalance, crosstalk is increased if the voice frequency impedance of the disturbing and disturbed circuits is increased. (To be exact, crosstalk in crosstalk units is proportional to $\sqrt{Z_a Z_b}$, when Z_a and Z_b are the impedance of the disturbing and the disturbed circuits.)

"Therefore, loading increases crosstalk due to capacitance unbalance. This is the reason that 'non-staggered twist' cables, manufactured prior to 1920 cannot be loaded. This also applies to some cables of more recent manufacture in which the staggering has not been adequate."

•

There is an apparent need for some arrangement to inform the user of a telephone that someone else is calling his number.

If a light could flash or a buzzer sound to indicate that someone else is calling, the average individual might terminate the first call sooner and talk to the second party. And if this signal could be actuated by a special carrier frequency that could be connected by dialing a special digit prior to or after calling the busy number, this service could be provided without the need of a second physical circuit.

Here's hoping that the inventors will get busy working on this idea.

•

Thirty years ago in 1929, the Bell Telephone Laboratories gave the first demonstration of color television. A picture was sent from one side of a large room to the other in a laboratory on West Street in New York City.

The picture was not much larger than a postage stamp, but contained easily discernible color in the American and British flags, flowers, a watermelon and a woman's dress. This event occurred two years after the first public display of black and white TV.

•

The American highway has been spattered with blood and money for half a century. In this period, 60 million Americans have been killed or injured in motor-vehicle accidents.

Every few seconds there is an injury.

Every fourteen minutes a death.

•

In Columbus, Ga., recently, we called Delta Airlines and made a reservation for a flight to Atlanta where we were to board a connecting flight for Washington, D. C. It was on a Friday and we were queried as to whether we wanted steak, cornish hen or fish. We selected steak cooked medium.

When we boarded the flight from Atlanta we were served a medium steak without any query as to what we had ordered. There is no doubt that Delta Airlines has a good communication system.

•

The Southern Bell Telephone & Telegraph Co. employs almost 20,000 operators—15,000 in Long Distance alone.

In order to move 42 million local calls and one million toll calls daily, traffic people are involved in many ways in addition to the vital operator job. Force administration and training are important responsibilities of the central office supervision.

Dial equipment groups handle equipment assignments and load balance. Behind the scenes, but involved with all of it, and looking to the future, are the traffic engineers. They translate the ebb and flow of traffic into kinds and amounts of facilities that meet the needs of tomorrow.

•

Frequently of late, we have noticed signs in front of new residences stating that this is a Telephone-Planned home. This indicates that the forward-looking builder who displays it has your present and future comfort in mind.

In a telephone-planned home you will never have to bore holes in the floors or walls to install telephones or to change locations. Convenient outlets make it easy to vary your telephone arrangements to meet your family's changing needs. The wiring is also out of sight because it was installed while the house was being built.

Operating companies everywhere would be well advised to encourage this practice and to publicize the advantages of telephone-planned homes.

•

An irate Britisher, in a letter to the Washington, D. C. *Evening Star*, suggests that public telephones—like other conveniences—should be designated specifically for men and women.

"Why not telephone booths for men only?", asks the writer, who points out that women occupy booths for 20 minutes at a time while men rarely take more than two or three minutes to make a call. "Let women keep each other waiting," he proposes. "I'll guarantee some of these marathon calls would be curtailed."

Waveguide and antenna shelter at Vandenberg AFB. The cable

COUNTDOWN.

Whenever an Atlas or Titan missile blasts off, Kellogg communications control and coordinate those all-important countdowns. All ground communications before, during and after a launching of these giant ICBMs takes place through Kellogg installations.

At Vandenberg Air Force Base, the U.S. missile training center, Kellogg has designed and engineered dramatic new apparatus and installed multi-thousands feet of cable as well as switching equipment that control the complex communications essential to successful missile launchings. Kellogg is associate contractor for Atlas and Titan missiles, a supplier for BOMARC, and a major participant in SAGE, making it possible for independent telephone companies to support and supplement the continental air defense system.

And Kellogg's ingenuity and experience has developed new and better systems and devices for defense communications. This same skill is constantly working to improve the services offered by independent telephony which Kellogg has been serving for more than 60 years.

Whenever you have a communications problem or need, call your Kellogg representative.

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CHICAGO, ILLINOIS
Communications Division of
IT&T

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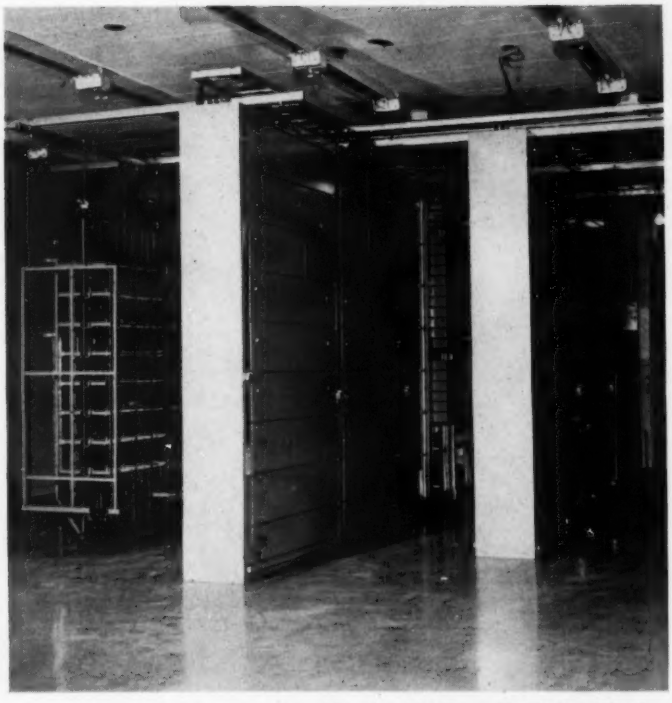
Atlas ICBM shortly after take-off.

inside the waveguide forms part of Kellogg's vast communications system at America's only missile training center.

..and count on Kellogg!



K-60 Crossbar was selected by the Air Force Ballistics Missiles Division to insure reliability of weapon system communication.

Kellogg engineers at Vandenberg confer in the shadow of an Atlas launching pad.

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KANSAS: 7th & Sunshine Road, Kansas City 15, Kansas, MAyfair 1-4418.
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TEXAS: 1515 Turtle Creek Blvd., Dallas 7, Texas, RIverside 7-5191.
EXPORT: 157 Prospect Street, Passaic, N. J., PRescott 3-5100.

The Farmer and the Telephone (Sec. II)

By L. N. MARTIN

IN THE first section of this discussion of the farm telephone (TELEPHONY, May 23, page 23) we brought out the fact that the telephone needs of the farm customer differ somewhat from the needs of other classes of subscribers. The telephone company will prosper by meeting the particular requirements of each class of subscribers.

We mentioned the great variety of services not offered to the urban business subscribers; services which not only please the customer, but add to the earnings of the telephone company. Very little has been done for the farmer, except that the eight or 10-party selective ringing dial line is rapidly becoming standard throughout the country. However, this does not always please many farmers who, strange to say, often have a longing for the old magneto line with its code ringing and 15 to 20 stations per line. When the wishes of the farmer are analyzed, it will be found that he liked certain features of the magneto service and would be happy if these features could be added to his dial line.

We then discussed the business, domestic, and social usages of the farmer's telephone and we will now continue with a study of its use in emergencies.

Farmers More Affected

No one will deny that the telephone is invaluable in emergencies. In fact if a home (city or country) had no business or social use whatever for a telephone, it would still be justified in having a telephone for its value in an emergency. This is especially true of the farm home.

The city man can step to the telephone, make one call, and in a very few minutes the police, the fire department, an ambulance, or a doctor will be at his door.

These municipal emergency services are not so readily available to the farmer and yet he is more affected by such emergencies than is the city dweller. He may not live within a fire

PART 71. The preceding article in this series appeared in the May 23 issue.

district and must rely on himself and his *neighbors* in case of fire. The sheriff may be far away in the county seat, but in most counties the sheriff has deputized some reliable farmer in each neighborhood, giving him authority to make arrests or to organize a posse. The doctor, hospital, and ambulance may be far away, but a neighbor with a truck or station wagon can rush a sick or injured person to the hospital or to a doctor. Again, we find that the ability of a farmer to quickly reach his neighbors by telephone is of paramount importance to him.

The tractor and the cornpicker have replaced the kicking mule and the run-a-way horse as the chief cause of farm accidents. Let us consider an all too common case. A tractor has overturned and a man is pinned under it. The only other persons on the farm are his wife and small children. The wife turns to the telephone for help. She will, of course, want a doctor from the city, but the *first* thing is to get that tractor off the man. The neighbors can do that. Most of them will have a tractor with a lifting device attached. Or, if enough men are present they can right the tractor with their bare hands.

The wife calls a neighbor by ringing his code on a magneto line, or by making a reverting call on a dial line. However, the first party called may not answer and at the second home called there may be no menfolks at home. Much time may be lost.

Now, the old magneto lines had a time-honored institution that could be used in a case of this kind. It was called the "General Call" or "Emergency Call." (We have heard it called the "Chicken Feed Call.") It usually consisted of a series of short rings and indicated an emergency, or at least something of great importance to all, and everyone within hearing distance of his telephone bell answered. Since there were 15 or 20 subscribers on the line plenty of help could be obtained by making one call. The operator would also answer and she could arrange for a doctor, an ambulance, or any other help needed from town. She could also ring the general call on an adjacent line and connect the two lines, thus alerting a large number of people.

Could Be Added to Dial

This was a truly wonderful arrangement and it is in use today wherever magneto lines survive. But, so far as we know, no one has applied it to a dial line. We believe that this feature could be added to any dial switchboard at a moderate cost and we offer the following suggestions.

A special reverting call circuit could be designed. Only one such circuit would be required at a small office and only a few in a larger office. When a rural subscriber dialed the number assigned to this equipment it would send back a reverting ring on the line which would ring all stations, either simultaneously, or in rapid succession, depending on the ringing system in use. This circuit would not have the usual tripping relay, and hence the ringing would not be stopped by the first receiver removed. A timing circuit would stop the ring after it had been repeated a predetermined number of times.

If the local office had 24-hour operator service the equipment could be much simplified and arranged so that it could be applied to one or more lines by the operator on request.

The ringing system most frequently used by Independent companies uses five frequencies, and five ringers are connected between each side of the line and ground, thus making a fully selective 10-party line. In this case, ringing current could be applied to both sides of the line at the same time regardless of the number of receivers off-hook. The five frequencies would be applied in rapid succession producing a series of short rings with an interval between rings equal to the time of four rings.

The Bell companies often use an eight-party semi-selective system with ac-dc ringing current and a cold cathode triode in each telephone. In this case straight ac ringing current applied to both sides of the line would ring all bells simultaneously.

Some companies have retained the old bridged code ringing when converting to dial. In this case, ringing would be shorted out when two or three receivers were removed. If this proved to be objectionable, a simple filter in each set would allow the line to ring with many receivers off.

Do Not Object to Code Ringing

Incidentally, most farmers do not object to code ringing. They rather like it. Perhaps it keeps them from feeling lonesome to hear the telephone ringing from time to time. Farm lines do not ring all night long. A ring after 11 p.m. means something of unusual importance, and a ring after midnight almost certainly means some emergency which may concern all on the line. However, about an hour before daylight farm traffic really wakes up.

Another use for this "general call" feature would be to transmit storm warnings. The weather bureau now issues tornado warnings which are broadcast by radio stations. However, to receive these warnings one must have his radio turned on and tuned to the right station. Tornadoes seem to have changed their calling hours from the usual 4 p.m. to 6 p.m. or 8 p.m. and now come at any hour of the night or early morning when few people have their radio turned on.

If the weather office were furnished maps showing the routes and line numbers of all rural lines, they could order an emergency call placed on all lines which might be within or near the path of the tornado which they had spotted. In the cities and towns, however, the siren is the best warning and a special code signal could be used to indicate a tornado.

Cost No Factor

We believe that this emergency call system would be of great value to the farmers; that its cost would increase rates very little; and that the equipment engineers can design the equipment for any type of board after it has been decided that such a service is commercially desirable.

Any telephone will be out of order at times. Absolutely trouble free service is not yet in sight, but a wonderful improvement has been made. Some of the large companies report an average of one case of trouble per telephone in 2½ to three years. However, it should be noted that these good averages do not help the subscriber who has excessive trouble on his own telephone.

On the average, the rural telephone will be in trouble more frequently than will an urban telephone. There are several reasons for this: The line is longer and the liability of any type of line circuit to trouble is always a function of its length. Open wire or rural distribution wire is used in the country and this has a higher liability to trouble than the aerial and underground cable used in town. There are more stations on the farm line, hence more people are put out of service by a single case of line trouble. The rural plant is more exposed to the elements. Even the telephone set is more exposed to damage by lightning. And yet the farmer needs uninterrupted service more than does the average city resident.

We see no remedy for this situation except to be especially careful with all construction and installation work, and to be very thorough in routine maintenance.

The clearing time on rural trouble also tends to be longer. This is partly due to the traveling time but how often have we heard a telephone man say—"That storm caused us a lot of trouble, but it is all cleared up now, *except some of our rural lines.*"

Handling Storm Trouble

After a big storm, the usual order of clearing is: (1) Essential Services (police, fire, hospitals, doctors, etc.); (2) business; (3) city residence, and (4) rural. This is not entirely wrong. The company wants to restore as many stations as possible each hour and to do this they work where the stations are closer together.

However, we believe that this situation can be improved if each company will give more thought to the handling of storm trouble. One company which employs five regular trouble men makes it a rule to place one man on rural and keep him there regardless of the amount of trouble in town. Construction and other forces with little trouble experience can help out in town where they can be closely supervised.

The importance of a case of trouble is not determined solely by the class of station. *Isolation* is an important factor. The total failure of a rural lead, isolating one-fourth of a county is more serious than the same number of city residence stations scattered over town so that each neighborhood has *some* service.

When the rural plant is converted from magneto to common battery or to dial, there are some changes in the effect of trouble on the service of the subscriber. Before discussing this it may be well to say a few words about the magneto set. Some of our younger readers may not be familiar with this basic type of telephone.

Basically the Same

There is really not much basic difference between the magneto and the common battery set. Both use the same type of transmitter and receiver. The same handset (containing the transmitter and receiver) may be connected to either type of set. This is the basic talking equipment of any telephone. The ringer is the same and the exact type used depends on the ringing system. The magneto set contains one piece of equipment that is not found in the CB set—the hand generator. This is a rugged and reliable piece of equipment that rarely gives trouble. The latest models are much smaller and lighter than the older generators, due to the use of superior metals in the magnets.

A transmitter requires a small amount of dc. In the CB set the power comes over the line from the central office storage battery. In the magneto set, the current is furnished by two dry cells, usually concealed in a box near the telephone. This difference in the battery supply requires a quite different circuit within the set and a different type of induction coil is used.

The transmission qualities of a magneto set are the same as those of a CB set if both transmitters receive the correct amount of current. The dry cells in a magneto set may at times be below par, reducing the outward transmission. On the other hand, some long CB rural lines may not furnish the proper amount of current to the transmitters.

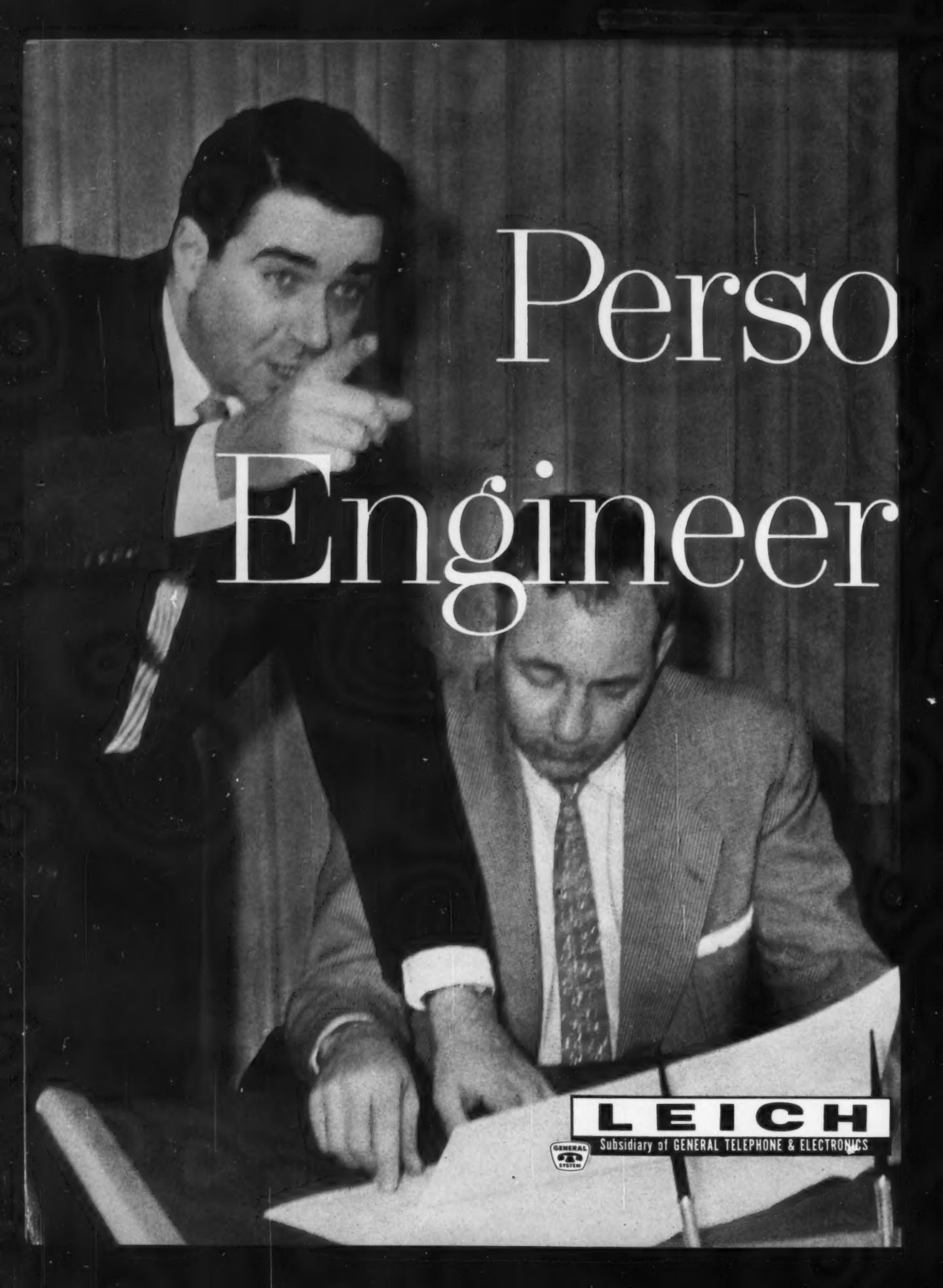
A unique feature of the magneto set is that it is self-contained. It contains its own power plant (dry cells and generator) and hence is entirely independent of power from a distant central office.

The magneto set has some faults, of course. The dry cells cause trouble due to their uncertain life span. Some fail suddenly putting the telephone out of service. Others fail gradually, causing a period of poor transmission before the cause is discovered. Also, the present type of magneto telephone cannot be connected to a dial switchboard and, for this reason, the magneto system is now classed as obsolete.

New Long-Life Battery

A new type of battery which will furnish a small amount of power over a long period (several years) without attention is urgently needed not only

(Please turn to page 55)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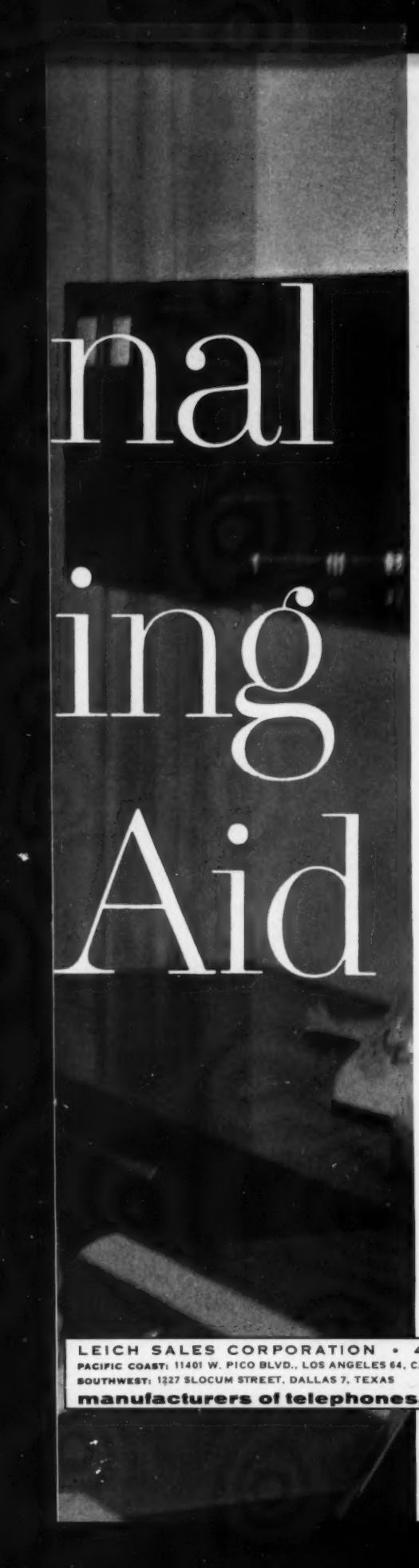

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Impact of Telephone Communication

On the Economies of the Various Geographic Regions of the U. S.

By ALEXANDER I. WARRINGTON

PART VI. Region 6. The Southwest—Oklahoma, Texas, New Mexico and Arizona.

The Southwest

THE PER CAPITA income was 1,655 dollars in 1956 and 394 dollars in 1939, an increase of 320.0 per cent. It was below the national average both years. In millions, the population was 12.5 in 1956 and 9.7 in 1939, an increase of 27.9 per cent; in 1956 there were 3.7 households and in 1939 there were 2.5, an increase of 47.4 per cent.

Also in millions, there were 3.9 telephones in 1956, with 31.7 per cent for business, and 1.1 in 1939, with 36.6 per cent for business. The increase in totals was 259.8 per cent.

Employment went up 290.0 per cent between 1939 and 1956. In thousands, there were 7.0 manufacturing establishments in 1939, and 3.7 in 1900; employment in 1956 was 612.0; in 1939, 213.4; and 1900, 49.8.

In millions of dollars, payrolls in 1956 were 2,728.0; in 1939, 258.8; in 1900, 24.6. Value added by manufacturing in 1956 was 5,738.0; in 1939, 590.4; and in 1900, 55.7.

In 1958, there were in thousands, 4,261.0 telephones, with 1,335.9 for business and 2,925.1 for residences.

In 1957, the personal income was 23,438 million dollars.

The states with the highest percentage employment concentrations in 1958, by type of industry, were:

Type of Industry	*State*
Mining	Oklahoma
Contract construction	Arizona
Manufacturing	Texas
Transportation and other public utilities	New Mexico
Trade	Texas
Finance, insurance and real estate	Texas
Service & Misc.	Arizona
Government	New Mexico

Oklahoma

The per capita income was 1,561 dollars in 1956 and 345 dollars in 1939; an increase of 352.4 per cent. In millions the population was 2.1 in 1956 and 2.3 in 1939, a loss of 7.1 per cent. There were approximately 0.6 households in 1956, a gain of 10.7 per cent.

In millions there were 0.7 telephones in 1956 and 0.2 in 1939, a gain of 157.5 per cent. Business telephones accounted for 29.7 per cent of the total in 1956 and 33.7 per cent in 1939.

In thousands, there were 1.5 manufacturing establishments in 1939 and 0.4 in 1900; employment, in thousands, was 98.0 in 1936, 37.5 in 1939, and 2.6 in 1900.

In millions of dollars, payrolls were 427.0 in 1956; 47.1 in 1939; and 1.1 in 1900. Value added by manufacturing in 1956 was 727.0; in 1939, 101.7; and 1900, 2.7.

In 1958 there were, in thousands, 777.9 telephones, with 230.7 for business and 547.2 for residence use.

The personal income in 1957 was 3,687 million dollars.

Employment in 1958 was as follows:

Type of Employment	*Percentage Distribution*
Total employment	100.0
Mining	8.7
Contract construction	5.8
Manufacturing	15.2
Transportation and other public utilities	8.7
Trade	25.2
Finance, insurance and real estate	3.8
Service and misc.	11.5
Government	21.1

Texas

The per capita income in 1956 was 1,686 dollars and 409 dollars in 1939, an increase of 312.2 per cent. The per capita income was above the region, but below the nation.

In millions, the population was 8.5 in 1956; 6.4 in 1939, an increase of 33.5 per cent. Households in 1956 came to 2.5 and 1.6 in 1939, an increase of 52.9 per cent.

Also, in millions, there were 2.7 telephones in 1956 and 0.7 in 1939, an increase of 276.8 per cent. Business accounted for 31.1 per cent in 1956 and 36.6 per cent in 1939.

In thousands, there were in 1939, 5.0 manufacturing establishments and in 1900 there were 3.1; employment in 1956 was 462.0; in 1939, 163.9; 1900, 41.4.

In millions of dollars, payrolls in 1956 were 2,060.0; in 1939, 196.7; 1900, 19.8. Value added by manufacturing in 1956 was 4,600.0; in 1939, 448.5; in 1900, 38.5.

Telephones, in thousands, in 1958 were 2,931.7, with 902.1 for home use and 2,029.6 for residence use.

(Please turn to page 50)

THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

WOMEN IN THE telephone industry are part of the 22 million American women who are working today. In the present era, more women do more work for more years—and live to enjoy it. But it was not always so.

Four million women were employed in the 1890's, if not at home, in the factory or office. Some 60 years later, the census shows us there are 22 million working women, one third of the entire laboring population. Yet the most significant change is not how many but who. Seventy-five per cent of the turn-of-the-century business ladies were single, half of them under 25. Now, half of the "grey flannel skirter's" are married and almost as many are over 40.

More women were working in 1940 than in 1890 at every age level except the very young or old. However, the pattern was similar. Ladies were active until age 20, then the professional number in the ranks steadily declined.

There has been a change in the past 19 years. Although there is a drop-off between ages 20 and 30, the female then comes out of premature retirement and heads back to the office till age fifty. Even then she's reluctant to quit. Women leave the make-a-living millions after this age, but more 60-year-olds were working in 1950 than when they were 10 years younger.

Not a little bit responsible for this office-ward migration were—and are—state laws covering the fair sex. Minimum wages, for instance. This practice was inaugurated in Massachusetts as early as 1912, but not until the depression and a 1937 Supreme Court decision, did the majority of states join with heaven to protect the working girl.

Thirty-one states now enforce this regulation, with 17 also insuring equal pay—a wage rate based on job, not sex. The latter measure grew out of World War II when men and women worked side by side on defense jobs, and not until 1940 did more than two states adopt it. Women had long known that "all men are created equal," but now it read "all men—and women." None would pass up such a wonderful opportunity.

Of course, there are more personal reasons for the professional trend, among women. Not only has the states' outlook changed, women's has, too. A woman's response to jobs is conditioned by her concern for her role as wife and mother. The two must not clash. Alterations in family life now make it possible for her to perform both jobs well.

The 1890 worker turned in her desk for homework and babies' care after marriage at 22. Nor did she go back to the job when her children were having children. Not so with today's working woman; like MacArthur, she returns. This is because she marries earlier; her last child enters school when she's 32 and marries before grandmother's 50. With no child to hang on to her apron strings, it's back to the office again.

Modified working hours also give her an opportunity to pamper her husband. Not only do states recognize the married woman's right to work outside the home, but also to do as she wishes with the paycheck. There are exceptions. Six states make joint bank accounts a mere formality—the wife's earnings are automatically under the control of her husband.

What are these 22 million American women working at? One of the characteristics of our growing economy has been the phenomenal increase in paper work. What was once one clerk with green eye shade and quill pen is now hundreds of stenographers with typewriters and computers. From an occupation once completely filled by men, the fair sex has taken over. Lest we forget, the first telephone operators were boys.

In 1890, women made up only 20.9 per cent of all office workers. Sixty years later, they constituted 62 per cent of these nine-to-fiver's. The greatest increase occurred during World War II when the number of feminine clerical workers doubled from 2.5 million to 5 million. By 1960? Our prophets see women sitting in 80 per cent of all office chairs. Only the stout-hearted male will survive.

Not only do females predominate in the clerical field—30 per cent of all professional women are clerical workers.

What is in store for the statistical scales of the year 2000? With longer life spans and shorter work weeks, grandmother, mother, and daughter may find themselves punching time cards in the same office. This is togetherness—but it may do away with the proverbial family get-togethers.

It was not uncommon 30 years ago for mother and daughter to work in the same telephone exchange. A man's world? I wonder!

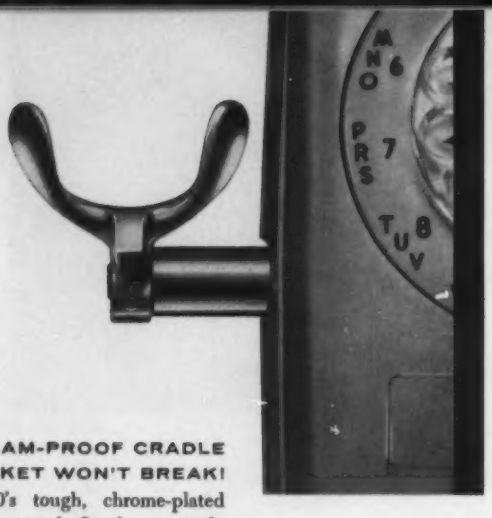
Traffic Questions

(1) May a charge on a long distance call be transferred to a third telephone anywhere in the United States or Canada without reaching that telephone to secure acceptance of the charge?

(2) If a place to which a call is to be billed is outside of your toll center area, what information is entered on the ticket?

(3) On a call transferred to a third telephone, if the operator recognizes the "bill to" number as being a hotel, by the party requesting the transfer either giving the hotel name or a room number, how should the operator proceed?

(Please turn to page 51)



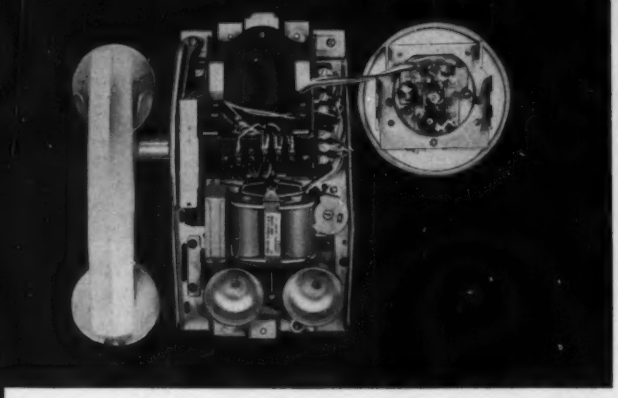
SLAM-PROOF CRADLE BRACKET WON'T BREAK! Type 90's tough, chrome-plated cradle is securely fitted to a sturdy shaft that turns in a long bearing-bracket. It's more than a match for the handset-slamming subscriber!

INSTALLATION AND MAINTENANCE ARE A SNAP! Loosen one screw, the cover lifts off and you fasten Type 90 to the wall (handset stays in the cradle). The loop compensator is adjusted from the front. To remove the dial, just push and lift. And, you can remove the ringer from the front – without taking the phone off the wall.

TYPE 90

HANDSET CAN HANG BEHIND THE CRADLE when it is necessary to leave the telephone. This keeps the handset from dangling down the wall and scratching the finish.

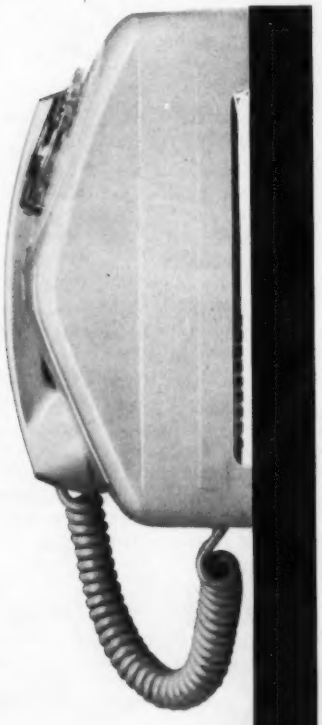
SMART, FUNCTIONAL DESIGN – really pleases the ladies! There are 10 decorator colors to choose from. Type 90 fits into the color scheme of any home.

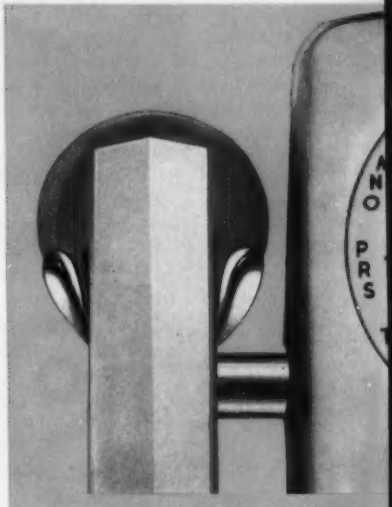


is better than any other wall phone happens to be!

These are the features that make Automatic's Type 90 your best wall phone buy. Prove it to yourself! Order a whole lot of Type 90's. Then see how pleased your subscribers will be with this wonderful wall phone. To order, just write: *Automatic Electric Sales Corporation, Northlake, Illinois. Or call, Fillmore 5-7111. In Canada, Automatic Electric Sales (Canada) Ltd., 185 Bartley Drive, Toronto 16.*

SHALLOW PROFILE!
Side-mounted handset doesn't stick out into the room. And, Type 90's special dial angle makes the numbers easier to read whether you stand or sit.





WRAP-AROUND CRADLE HOLDS HANDSET SECURELY!
Type 90's handset can't be dragged, brushed or knocked off the hook. This keeps "off-hook" trouble calls down.

AUTOMATIC ELECTRIC GENERAL SYSTEM
Subsidiary of
GENERAL TELEPHONE & ELECTRONICS

Courts and Commissions

New Rates Allow Minn. Co. 5.23 Per Cent Return

The Spring Grove Cooperative Telephone Co. on Aug. 11 was authorized by the Minnesota Railroad & Warehouse Commission to raise rates.

The Spring Grove company is a newly-formed corporation which, on Mar. 2, purchased the Village Telephone Co. and the Spring Grove Telephone Exchange.

It serves approximately 383 company-owned stations and 387 switcher stations.

Under its old rates, net revenues were $14,644 resulting in a loss to the company of $2,915 per year. With the new rates, which are scheduled to go into effect after Aug. 31, the company will have net revenues of $21,654, giving it a net income of $1,434 or a 5.23 per cent return on its current value rate base of $27,417.

Old rates and new net rates are as follows:

	Old	*New*
One-party business	$1.50	$3.00
Two-party business	—	2.75
One-party residence	1.25	2.50
Two-party residence	1.08	2.00
Four-party residence	—	1.75

$194,000 Rate Increase Asked in California

The California Public Utilities Commission has set Sept. 1-3 as dates of a hearing on the $194,000 rate increase asked by the Coachella Valley Telephone Co., Thermal.

The company serves approximately 7,800 subscribers in Coachella, Eagle Mountain, Indio, La Quinta, Mecca, Oasis, Palm Desert, Thermal, Thousand Palms, and Desert Shores.

Pa. Company Asks Purchase OK; Rate, Bill, Change

The York Telephone & Telegraph Co. has asked the Pennsylvania Public Utility Commission for: a purchase approval, a rate reduction, elimination of discounts, and permission to bill subscribers in advance.

The company announced on July 24 that it had asked for authority to buy the York Eastern Telephone Co., Stewartstown. The York Eastern company provides service to 1,270 subscribers. York plans to convert it to automatic operation.

The reduction in rates will come about in connection with the elimination of discounts.

LaVern E. Grandy, company vice president, illustrated the proposal as follows:

Four-party service is now $2.50 with a 25-cent discount for prompt payment. The proposed rate is $2.25.

In the case of one-party business service, a rate of $7.75 is charged with a 50 cent discount. The proposed rate is $7.25.

The company also asked for advance billing saying that it has become standard industry practice.

The York company serves 52,568 subscribers. Grandy said it had had no change in rates for more than 30 years.

Company Presents Broader Ownership Plan Bid in Ga.

The Georgia Public Service Commission, it was reported on July 16, received a request from the Consolidated Telephone Co., Moultrie, for approval of broader ownership of its stock.

A part of the plan called for the issue of $282,000 in stock on a new holding company to be known as the Gold Leaf Telephone Co., which would include Consolidated's eight subsidiary exchanges, Meigs, Coolidge, Boston, Pavo, Hahira, Ray City, Lakeland, and Morven. James L. Kirk of the Consolidated company said this plan would allow the company to borrow money from the REA.

The company further asked permission to issue $100,000 in stock to finance future construction.

Also included in the stock proposal was a request for authority to issue $200,000 in debentures, some of which would be issued to the four Kirk heirs in lieu of money loaned by them to the company.

One in Wis. Asks to Sell; Other Requests Raise

A hearing set by the Wisconsin Public Service Commission for Aug. 17 was to consider the application of the Eau Claire County Telephone Co. for authority to sell its property to the West Wisconsin Telephone Cooperative, Inc. The buyer is asking permission to rebuild the property to be acquired.

On Aug. 19, the commission was to hear the rate application of the Hager City Telephone Co.

SW Bell Granted Rate Raise, Paystation Increase in Tex.

The Southwestern Bell Telephone Co. was granted approval by the Hillsboro, Tex. city council to raise rates for one-party service.

One-party residence service goes up from $4.75 to $5.25. One-party business rates have been increased from $10.50 to $11.50. Rates for two-party residence service remain the same at $4.00.

The company was also allowed to raise the charge for paystation calls from five cents to 10.

OK $5,000 Note at 6 Per Cent For Oregon Independent

The Oregon Public Utility Commissioner on Aug. 13 approved the application of the Redwoods Telephone Co., Cave Junction, to borrow $5,000.

The company plans to borrow this sum from Leslie L. and Effie M. Parsons. The note, which will bear 6 per cent interest, will be due within five years.

The Redwoods company serves 704 subscribers. It plans to use the proceeds of this transaction for numerous small construction projects including changes in switchboards, additional cable, rural distribution wire and open wire and for upgrading existing service and providing facilities for new services.

OK Sale of Mo. Exchanges

George A. Hearne, vice president and general manager of United Telephone

Co. of Missouri, reports that the Missouri Public Service Commission recently approved the sale of its Chamois and Morrison exchanges to the South Missouri Telephone Co., Steelville.

SW Bell Files Metropolitan Service Plan in Missouri

The Southwestern Bell Telephone Co. on July 21 proposed to the Missouri Public Service Commission a "metropolitan service plan" in the Missouri portion of the Greater Kansas City Area, similar to a plan for the Kansas part of the area.

The plan as presented to the commission would set up three types of zones in the area. The center zone would be the Kansas City zone. There would be seven first-tier zones surrounding the central zone. Beyond the first tier would be several others designated as second-tier.

According to Justin E. Hoy, division manager of Southwestern Bell, the second-tier zones would be set up in what is now long distance territory. "There would be no toll charges between any adjoining zones," said Mr. Hoy. "All first-tier subscribers would call the center zone free. Subscribers in the second tier would have the option to do likewise."

In second-tier zones, subscribers having regular "zone" service could call adjoining zones free, but would pay toll on calls to non-adjoining zones. An alternate plan for second-tier-zone subscribers would give them a higher monthly rate for what is called "optional" service, with no interzone tolls on their calls.

"Obviously, the proposed plan would make telephone service much more valuable than it is today," said Mr. Hoy. "Usage would increase because of the removal of interzone and long distance charges."

He indicated that in many cases, the elimination of interzone charges would offset any increase in basic rates. The plan could go into effect "sometime next year" after commission approval and installation of the necessary equipment.

The operation of the suggested plan, in Independence, Mo. and an area called "East Independence" would be as follows:

The first tier area would extend about one and one-half miles east of the eastern limits of Independence. Beyond this would be the second tier known as the "East Independence" zone.

An Independence zone subscriber would be able to call persons free in the central "Kansas City" zone, in the

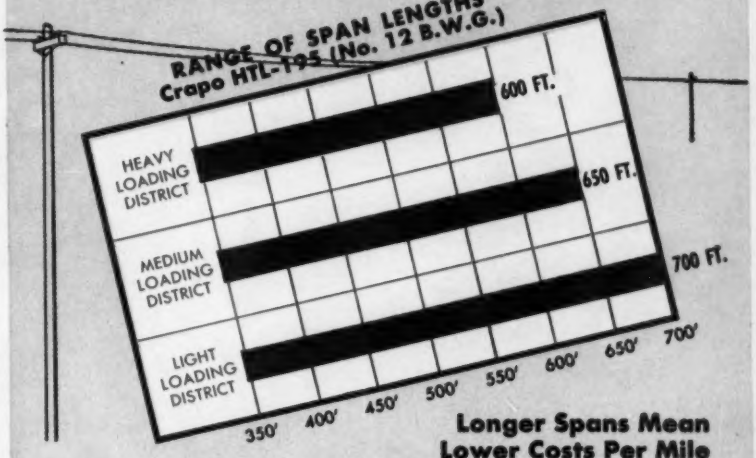
(Please turn to page 42)

Crapo

HTL-195

FOR EXTRA LONG SPAN RURAL LINES

The *NEW LOWER* Resistance Extra-High Tensile Line Wire

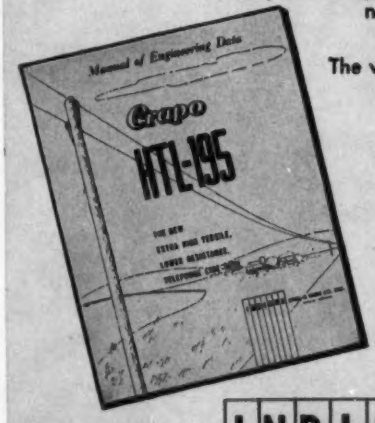


Longer Spans Mean Lower Costs Per Mile

You can cut the number of pole structures to a minimum when you use Crapo HTL-195 in building rural telephone lines. Extra long span construction, made possible by the high physical strength of this new wire, means marked savings in material and installation costs.

The voice transmission quality of Crapo HTL-195 is equal to that of Crapo HTL-135 and superior to older grades of ferrous wire.

Pertinent technical data have been prepared to assist engineers in designing and building extra long span lines with Crapo HTL-195.



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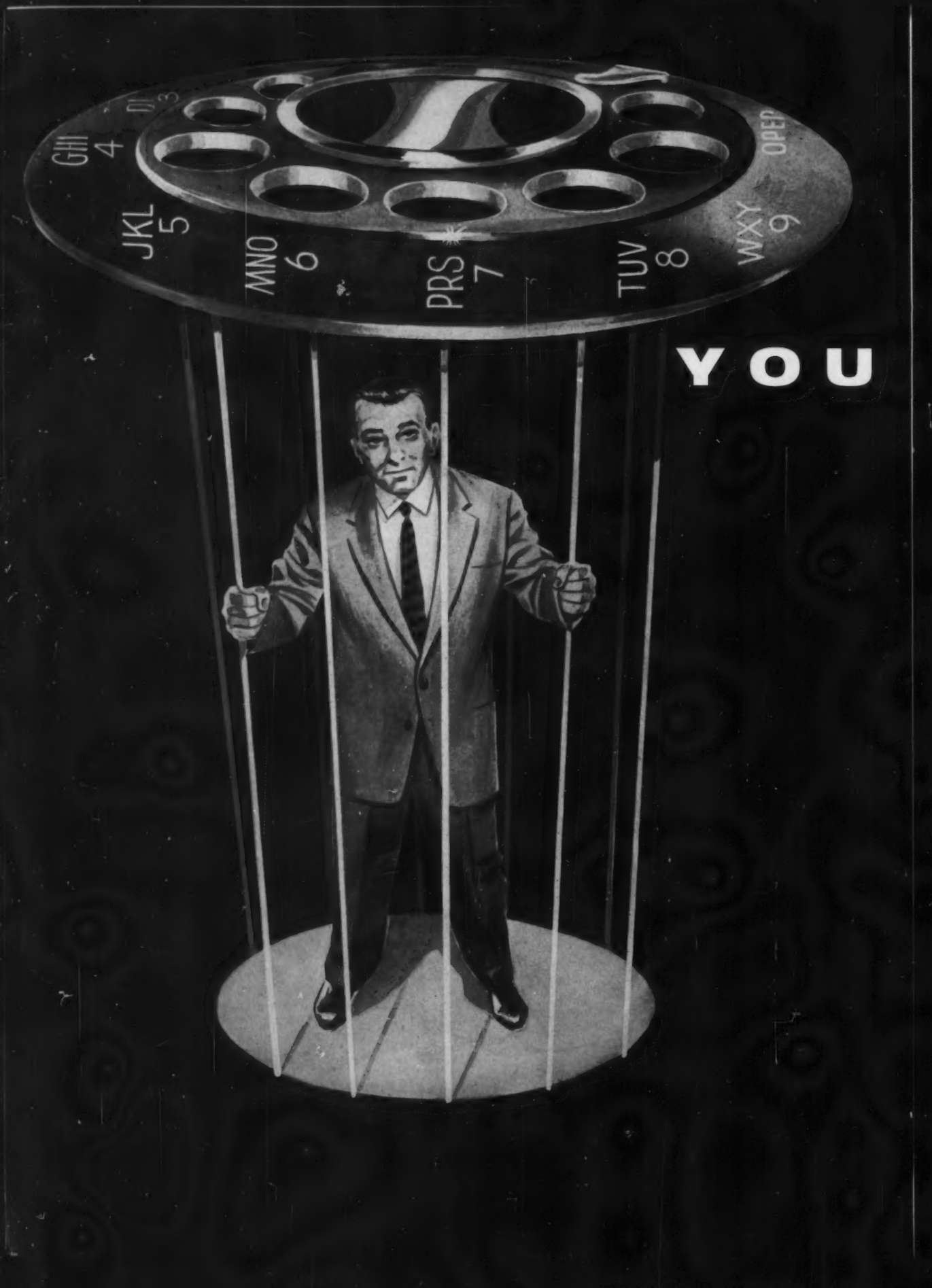
INDIANA STEEL & WIRE COMPANY, INC.
MUNCIE, INDIANA


GHI 4
JKL 5
MNO 6
PRS 7
TUV 8
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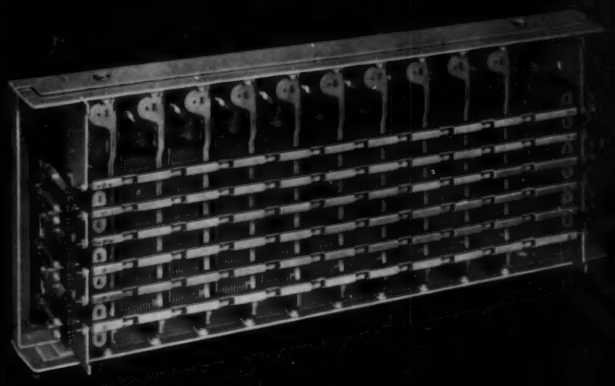


were ~~ARE~~ TRAPPED!

The ten-pulse dial, and the resultant decimal system basis for switch design, imposed limiting factors upon direct dial switching equipment—factors that became more and more limiting as the demands upon switching equipment became constantly heavier.

Crossbar switching introduced a new concept of basic design that went beyond the "ten finger" decimal concept.

Crossbar is not just another "type" of switching equipment—it is an advancement that shatters the artificial boundaries of "ten multiple" switching. It brings new trunking capacity and flexibility to telephony.

North By-Path Crossbar brings to the Independent Telephone Companies switching capabilities to meet the challenge of the future.

North Crossbar is the only switching equipment available to you that has been designed and engineered to completely satisfy all the requirements of nation-wide network telephony!

North Crossbar has the ability to route traffic independent of the numbering scheme or number of selector stages! North Crossbar can fully utilize the advantages of multi-frequency signalling on trunk lines! It is adaptable to key sending when such instruments become available! No other system can provide so much traffic handling capacity in so little space.

The operating companies who have already installed North Crossbar recognize the inherent capabilities of this new approach to switching. They are enjoying its efficiencies and economies today.

To learn what North By-Path Crossbar is—and what it can do for you, write North Electric Company, Galion, Ohio for the "NX-1 Fact File"—today.

NORTH BY-PATH CROSSBAR IS ANOTHER ENGINEERING ACHIEVEMENT OF

THE DYNAMIC FORCE IN THE TELEPHONE INDUSTRY

NORTH ELECTRIC COMPANY

GALION, OHIO

NORTH

neighboring first-tier zones of "Raytown" and "Gladstone," and also in the adjoining second-tier zones of "East Independence," "Liberty," and "Lee's Summit." Likewise, "East Independence" subscribers would call free to Independence, Lee's Summit, or Liberty.

Mr. Hoy said the new plan would eliminate interzone charges on 7 million messages annually, and therefore would require a basic rate increase. The proposed rates vary in different areas.

Current and proposed rates for Independence and Clifton subscribers are shown as follows:

	Present	*Proposed*
One-party residence, Clifton	$7.25	——
One-party residence, Independence	4.75	$6.55 (flat rate)
Two-party residence, Clifton	6.25	——
Two-party residence, Independence	3.75	4.90 (flat rate)
Four-party residence, Independence	3.00	3.80 (flat rate)
One-party business, Clifton	11.50	——
One-party business, Independence	10.50	16.70 (flat rate)

Local subscribers in the "East Independence" zone would have the following rates:

One-party residence	$5.00
Two-party residence	4.00
Four-party residence	3.00
One-party business, flat rate	11.50

Persons in the "East Independence" area could have an optional service enabling them to call the central Kansas City zone. Rates would be $10.55 for one-party residence; and $20.70 for one-party business.

The changeover in equipment costs, would be 1¼ million dollars, according to Manager Hoy. However, he pointed out that, under the new plan, subscribers in the central Kansas City zone would be able to call 525,000 telephones without charge, compared with the present total of 452,000 telephones. First tier subscribers would be able to call free 355,000 telephones in the central area, plus thousands of others, also free, in adjoining areas.

Report Sale in New York

The Cato-Meridian Telephone Co. Cato, N. Y., has been purchased by the Independent Telephone Co. of New York City, it was reported recently.

SW Bell Granted Raise At Texas Exchange

The Wharton, Tex., City Council recently granted the Southwestern Bell Telephone Co. an increase in rates. Under the old rates, the company had formerly earned only 3.87 per cent on its investment.

Old and new rates are as follows:

	Old	*New*
One-party business	$10.00	$11.00
One-party residence	5.25	5.50
Two-party residence	——	4.25

Seek OK To Buy in W. Va.

The United Telephone Co., St. Marys, on Aug. 1 was reported planning to ask the West Virginia Public Service Commission for permission to acquire the Grantsville Telephone Co., the Rural Telephone Co., and the Wallace Telephone Co., Sardis. These three companies serve approximately 3,500 stations.

OK Stock Sale in N. C.

Central Telephone Co., Hickory, was authorized by the North Carolina Utilities Commission on Aug. 6 to sell 23,000 shares of its $10 par value common stock to its parent company, Central Electric & Gas Co. (TELEPHONY, Aug. 8). The price will be $21.75 per share.

This photo of those attending the USITA Management Development Program at the University of Kansas was taken on the program's opening day, July 12 and includes FIRST ROW, seated, left to right: Berlin Johnson of Virginia Telephone & Telegraph Co., Charlottesville, Va.; Wayne A. Johnson, West Coast Telephone Co., Everett, Wash.; E. D. Wilkinson, Southeastern Telephone Co., Tallahassee, Fla.; Stewart W. Phillips, General Telephone Co. of Pennsylvania, Erie, Pa.; Jack A. Grossman, Rochester Telephone Corp., Rochester, N. Y.; Marvin E. Winans, West Coast Telephone Co., Everett, Wash., and John J. Clarke, California Water & Telephone Co., Monrovia, Calif. SECOND ROW, standing, left to right: Dewey H. F. Wong, Hawaiian Telephone Co., Honolulu, Hawaii; Dusty Kemper, General Telephone Co. of The Southwest, Brownfield, Tex.; Chris B. Hansen, General Telephone Co. of Indiana, Inc., Elkhart, Ind.; B. F. Stalter, General Telephone Co. of Wisconsin, Plymouth, Wis.; Herman Graves, The Southwestern States Telephone Co., Brownwood, Tex.; Hodgen O. Patrick, General Telephone Co. of California, Santa Monica, Calif.; John Louis Runkle, Central Telephone Co., Hickory, N. C.; Russell Logue, C. T. & N. Telephone Co., Casey, Ill., and Kenneth A. Young, Central Telephone Co., Fort Dodge, Ia. THIRD ROW, standing: John H. McHenry, Capital City Telephone Co., Jefferson City, Mo.; Benjamin Kauahikaua, Hawaiian Telephone Co., Honolulu, Hawaii; Dick F. Perley, Middle States Telephone Co. of Illinois, Des Plaines, Ill.; Floyd L. Reyher, Haxtun Telephone Co., Haxtun, Colo.; Charles P. Lamm, Virginia Telephone & Telegraph Co., Charlottesville, Va.; Allan E. Lindekugel, Central Telephone Co., Fairmont, Minn.; C. Frederick Roth, American Telephone & Telegraph Co., New York, N. Y.; John D. Cooper, Rochester Telephone Corp., Rochester, N. Y., and Richard Lashley of the University of Kansas, Lawrence, assistant director of the program.

The parent company in its petition said the proceeds will be used to meet construction needs of the Central Telephone Co. and two Virginia subsidiaries and to redeem unconverted stock.

Sale of Company to SW Bell Approved by Kansas Court

The Dover Telephone Co. Inc.'s request for permission to sell to the Southwestern Bell Telephone Co. was approved in Topeka (Kan.) District Court by Judge Dean McElhenny, it was reported on Aug. 9.

The petition for authority to sell the Dover company was filed on May 1 by its president, Russell Woofter of Maplehill.

The petition said that the company was unable financially to convert to automatic operation.

The court's approval was sought, Mr. Woofter said, because so many of the company's stockholders of record were "dead or departed" that it was impossible to obtain the two-thirds stockholder approval otherwise needed to authorize the sale.

Seek New Rates in Montana

A hearing on the application to raise rates filed by the Southern Mountain Telephone Co., Wisdom, was scheduled for Aug. 7 by the Montana Public Service Commission. The Southern Mountain company said the rates are needed to operate on a 24-hour basis when the Dillon exchange cuts over to automatic operation. It now operates only 13 hours on week days and five hours on Sunday.

OK Expansion in Arizona

The Western States Telephone Co., Inc., Holbrook, was granted permission on July 23 by the Arizona Corporation Commission to operate in the area formerly served by the government-owned White Mountain Telephone Exchange.

Hear Rate Request in Wis.

A rate request for the Pilsen Telephone Co. was scheduled to be heard by the Wisconsin Public Service Commission on Aug. 12.

Ask Raise in Oregon

The Glendale Telephone Co. on July 27 filed a petition with the Oregon Public Utility Commissioner asking for a rate increase.

DDD in West Berlin

West Berliners now have direct distance dialing to 50 per cent of West Germany, according to a report from the Berlin Tourist Office. Direct dial service to Hamburg and the state of Schleswig-Holstein is scheduled to start in August. This fall, the system will be extended to the districts around Frankfurt and Munich. The Duesseldorf area was linked directly to West Berlin this spring.

SAFETY THUMB TACKS

By John A. Bracken

Bits of safety reasoning, either pointed or flat, depending upon the way you look at them:

"In practicing *safety*, you not only avoid personal injury, you prevent injury to others."

•

"Do not allow indifference to be the cause of an accident."

•

"A minimum of danger has a disconcerting way of turning to a maximum, where *safety* is neglected."

•

"When driving, slow down at sundown."

General of California Develops Safety Program

Last fall the General Telephone Co. of California launched a program of first aid education for its nearly 10,000 employes. Two-fold aim of the program was to train personnel to deal adequately with emergency situations, and at the same time emphasize accident prevention.

The first step was to train a corps of management employes to qualify as instructors in first aid. Today the company has some 385 qualified first aid instructors, including four instructors certified by the Red Cross as instructor trainers. The project of providing at least 12 hours of first aid instruction to every one of its employes is now under way.

Safety has long been one of the basic tenets in the operation of General of

Instructing Glendora, Cal., police and firemen in first aid transportation methods is Max Glassco (right rear), safety coordinator at General Telephone Co. of Cal., who is a certified Red Cross first aid instructor. Pictured left to right are firemen Robert Snow, Ronald Adams, Edw. Brooks, Robert Bjorklund Jr., Mr. Glassco, Joseph Schwartz, Leonard O. Hammer and Police Sergeant Jay McElwain. Fireman Carl White is in the handlitter.

California, according to A. R. Valantine, director of safety at General.

"A constant reminder of this fact is visible to employes in the form of a legend, which appears on the dashboard of company cars, trucks, bulletin boards—wherever it may catch the eye," Mr. Valantine said.

"The demands of the service, or the importance of the job, are never so important that we cannot take time to do the job safely."

Typical of the men selected by General to train as first aid instructors is Max Glassco of Glendora, who, after receiving his credentials, contacted the local Civil Defense organization and offered to instruct its members in first aid skills. Currently, he teaches first aid methods to the Glendora police and fire departments.

A native Californian, he was born in Los Angeles and grew up in the Covina area.

He attended the University of Southern California and started with General Telephone in 1938 as a truck driver in the Pomona exchange. Mr. Glassco is safety coordinator attached to the General office in Santa Monica.

Subscriber Stock Sales Provide Capital in Mexico

Telefonos de Mexico, S.A. sold 8 million dollars worth of stock in June, according to an Aug. 7 report. Applicants for telephone installations must purchase $240 worth of stock.

During the month of May, the company raised 5.2 million dollars from stock purchases, bringing new investments so far this year to 13.2 million dollars.

In 1958 the company installed 35,000 telephones in Mexico City bringing the total number of telephones to over 450,000. This is compared with 300,000 in 1952. Thousands of installation applications are still pending, the report said.

D.C. AT&T Executive Receives BDSA Award

W. Elmer Pothen of Washington, D. C., executive assistant with the American Telephone & Telegraph Co., has been granted an award of merit by the Business & Defense Services Administration of the Department of Commerce.

Mr. Pothen received the award for his work in behalf of the national defense executive reserve of BDSA.

H. B. McCoy, BDSA administrator, said the scroll was presented to Mr. Pothen in recognition of his service as general sessions chairman and chairman of the arrangements committee of the executive reserve conference.

Receiving a merit award from the Business & Defense Services Administration is W. Elmer Pothen, third from right, executive assistant, American Telephone & Telegraph Co. BDSA men attending the presentation are, left, J. G. Bonnar, assistant director, communications industries division; Alexander J. Falk, director, communications industries division; H. B. McCoy, BDSA administrator; Charles B. Hersum, executive reserve coordinator, and Louis A. Traxel, executive reserve coordinator. Others are Mr. Pothen, Lloyd S. Miller, director, Washington office, American Telephone & Telegraph Co., and Edward J. Ford, assistant to the president, Indiana Bell Telephone Co.

The reserve was created to staff the operation of a production agency in case of national emergency. The conference provided a briefing for the reservists on their post-attack activities which would aim at providing essential facilities and services for public welfare and industrial operations.

Mr. Pothen served in 1953-54 as a division director and assistant administrator for BDSA. This was under the program whereby industry executive personnel are made available to the government on a temporary basis.

Formerly associated with Northwestern Bell Telephone Co., Pothen was assistant general manager at Sioux Falls, S. D., and assistant vice president, Omaha, Neb.

'59 "Accident Facts" And Office Safety Book Issued

The 1959 edition of "Accident Facts," the National Safety Council's statistical yearbook, is now available, the Council has announced. It contains facts and figures on all types of accidents—home, traffic, industrial, farm, public, and school.

Several sections of the publication are devoted to industrial accidents, and provide a comprehensive background for an industrial safety program.

The booklet contains a list of accident rates for major industry groups, accident trends, the part of the body most often injured in accidents, and off-the-job accident problems.

The 96-page publication provides ideas and facts for making speeches, writing articles, preparing reports and planning safety campaigns.

The Council has also prepared a pamphlet on "Accidents in the Office!"

"Experience shows," the publication says, "that many office accidents can be eliminated by common sense and courtesy."

Here are some sample tips contained in the pamphlet:

Keep to the right at blind corners in the office.

Don't open more than one file drawer at a time.

Be wary of smoking near such highly flammable materials as duplicating fluid.

For further information on "Accident Facts" and quantity prices on this yearbook; and for single, free copies of the pamphlet, "Accidents in the Office!" write or contact the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

IN THE NATION'S CAPITAL

Continued from page 18

Commerce show that the net installation of telephones continues its upward trend.

At the present rate, this report shows there will be an increase of 3,933,000 during 1959, bringing the total telephones in the United States to 70,563,000 by the end of this year.

The BDSA report indicated percentage gain of 5.9 per cent over 1958 in the number of telephones installed. Last year the net gain was 3,009,000 telephones or 4.7 per cent over the previous year, 1957. This gain bettered the estimate for 1958 by 0.2 per cent.

A decline in the number of employes in the telephone operating field was noted. Automation was believed responsible for some of this decrease, plus resignations and a curtailment of rehiring replacements to fill vacancies.

The 1958 estimated expenditures for new plant and equipment of 2.7 billion dollars for the communications industry was not realized, the final figure, 2,534 billion dollars falling short by 166 million dollars, or 400 million dollars less than 1957. Most of this decrease was in building construction, as shown by the following BDSA table (000's omitted):

Year	(1) *Buildings*	(2) *Outside Plant*[A]	(3) *All Other*[B]	(4) *Total*
1956	$235,000	$825,000	$1,500,000	$2,560,000
1957	250,000	812,000	1,875,000	2,937,000
1958	190,000	709,000	1,635,000	2,534,000

[A]Pole lines, underground and aerial plant, drop, and block wire, etc.
[B]Central office and subscriber station and general equipment.

The economic condition of the country is reflected in the activities of the telephone industry, but there is some economic lag, according to BDSA's month-to-month analysis of net station gain and number of telephones.

There is considerable "lead time" on production, due to the fact that all facilities are "tailor made."

Likewise, an upward trend in the overall economic climate is not immediately reflected in the use of telephone communications.

Toll calls so far this year have increased over 1958, ranging between 14 and 16 per cent. The BDSA report took notice of the 50 million dollar reduction for toll telephone usage recently ordered by the FCC. While this is expected to cut earnings, it was believed that, over the long run, the reduced rates would bring about increased use of toll facilities.

All indications are that 1959 will be a record year on toll calls and local calls as well.

The relation of telephones per hundred population for the years 1957 to 1959, inclusive, is shown in the following table from the BDSA's report which reflects increasing telephone density:

Year	*Population (000's omitted)*	*Telephones (000's omitted)*	*Phones Per Hundred Population*
1957	171,000	63,621	37.2
1958	174,680	66,630	38.2
1959 (Est.)	177,500	70,205	39.6

Report On Manufacturing

The 1959 business prospects for the communications equipment manufacturing industry were also reviewed in the BDSA's report. Although sales for the first quarter of 1959 were slightly lower than for the first quarter of 1958, the industry sales for the remainder of 1959 are expected to exceed 1958 volume by 10 per cent, approaching the 1957 level (The industry's peak year). Employment has already increased by over 6,000 employes during the first half of 1959. Building construction during the first six months has increased approximately 2 million square feet of floor space and the accelerated pace now in progress will continue for the second half of the year to accommodate the healthy backlog of orders from the operating companies.

The BDSA report shows the levels of principal production or shipments for the recent years as follows:

Product	*Unit of measure*	*Quantity of Production in Units 1958*	*Estimated 1959*
Telephone sets	sets	7,005,915	7,900,000
Automatic central office equipment	lines	3,177,635	3,800,000
Automatic PABX equipment	lines	463,322	500,000
Manual central office equipment	positions	4,719	5,200
Manual PBX equipment	positions	8,882	11,150
Ringing machines	units	19,387	20,500
Repeater equipment (voice and telegraph)	repeaters	362,016	350,000
Intercommunication equipment	stations	11,647	15,200
Telegraph office equipment	instruments	50,921	52,000
Protectors, communications	units	3,438,254	3,425,000
Cable terminals	units	940,178	800,000
Telephone booths, metal	booths	26,431	29,000

The manufacture of telephone instruments and automatic central office equipment were said to be the "common production indicators as to the trends of the communications industry." The operating communications industry relies upon small manufacturing business to a great extent, as evidenced by purchases in 1958 from some 32,000 manufacturers of which 90 per cent employ less than 500 people.

These purchases amount to 1,150 billion dollars each year.

During 1957, the communications manufacturing industry provided employment for some 178,000 workers who were paid 970 million dollars. The employment is estimated to reach around 173,000 workers in 1959.

The following tabulation from the BDSA report shows the employment situation for 1958 and 1959 as follows:

(Thousands of Employes at End of Year)

	1958	*Est. 1959*
Bell manufacturers	143.8	151.3
Independent manufacturers	19.2	22.2
Total	163.0	173.5

The United States' export and import trade in communications equipment is relatively small compared with domestic consumption. Exports of telecommunications equipment have increased by more than 50 per cent in the past few years and it is estimated that the export sales will reach 55 million dollars in 1959.

1959 Manufacturing Outlook

"The ingredients of an upward trend for 1959 are present when strong consumer demands, rising investments in capital goods, and record construction outlays all combine," says the BDSA report. Over 4 million square feet of floor space will be added, with a gross capital investment of well over 200 million dollars. The outlook for 1959 sales indicates a more favorable increase than anticipated six months ago and should reach 2,850 million dollars,

(Please turn to page 48)

WESTERN ELECTRIC AND

FROM Western Electric's Point Breeze Works go many millions of feet of telephone cable to every corner of the nation. Some of this shipment may have been for your town.

BALTIMORE, MD.

For over a quarter of a century this great port city has helped Western Electric make the Bell System's communication network that binds the nation together. Like our other home towns, Baltimore shares both the work and the rewards.

Take a boat ride down the Patapsco River toward Chesapeake Bay, then look back. Only here can you see the full sweep of fabulous Baltimore . . . its handsome skyline, its forty miles of deepwater docks and its industrial area.

Here too you can see the Point Breeze Works of Western Electric where more than 6000 Baltimoreans help us make telephone apparatus and equipment for the Bell System — including enough wire and cable in a year to girdle the globe 258 times.

What does this huge Western Electric plant mean to Baltimore? It means jobs and payrolls to spend with local merchants, taxes we pay and business for our over 800 local suppliers. Last year throughout the whole state of Maryland we paid out over 9 million dollars to 915 firms.

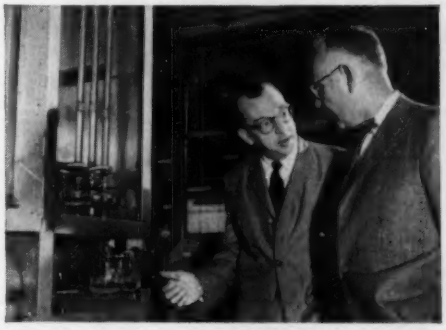
Being in Baltimore means something to us, too. We benefit from the skills of a superior work force and enjoy the traditional hospitality of this fine old city.

Besides Baltimore, Western Electric has manufacturing plants in 24 other cities where we also make hundreds of different telephone products for the Bell System. Last year we purchased over a billion dollars worth of raw materials, products and services from more than 30,000 suppliers located in every state of the Union. Of these, 90% are "small businesses." The things we make and buy are distributed to the Bell telephone companies through Western Electric distribution centers in 32 different cities.

Western Electric

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

BEAUTY QUEEN of the Point Breeze Works, Jan Amend, receives United Appeal plaque on behalf of fellow employees, all of whom gave a minimum of four hours pay (a total of about $64,000). Making the presentation on behalf of United Appeal is Campaign Chairman Robert W. Thon, Jr., VP of the Savings Bank of Baltimore.

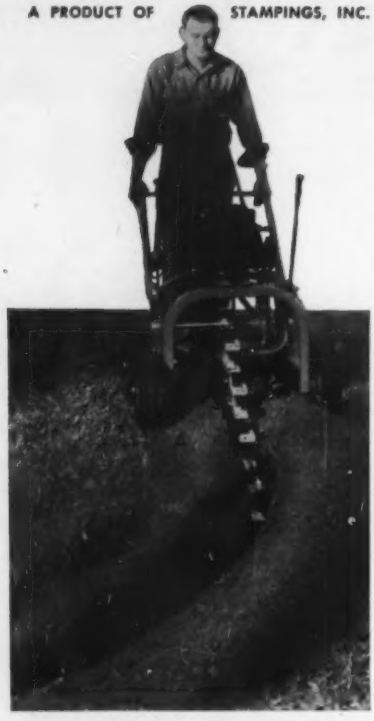


LOCAL SUPPLIER. Kinlock Yellott (right), President of the Haven Chemical Co., and Western Electric buyer, Robert Giblin, observe as copper wire is simultaneously insulated and color-coded with vinyl ink. Mr. Yellott's firm supplies the ink.

VOLUNTEER FIREMAN. W.E.'s David Weiss (left) often meets with Baltimore County Fire Chief Win Winholt to coordinate activities of the paid and volunteer departments. Dave is Executive Committee Chairman in the Volunteer Fireman's Association.

BUSINESS EDITOR Carroll Williams, Baltimore SUN has said of Western Electric: "a solid corporate citizen which makes important contributions to the dynamic economy of Baltimore. They keep a lot of wheels turning." We value his comment highly.

A PRODUCT OF STAMPINGS, INC.



THIS TRENCH IS COSTING ONLY 1 CENT PER FOOT

with the POW-R-SPADE TRENCHER

Unsolicited performance reports from actual users state that POW-R-SPADE narrow trenches cost only 1 cent to 3 cents per foot, *including labor.* (Many report much less than 1 cent per foot.) Digging speed varies from 1½ ft. to 17 ft. per minute depending on soil conditions. POW-R-SPADE is light, rugged, with minimum of maintenance. Shipped *completely* assembled. Neat, fast, professional trenches—3 in. wide to 24 in. deep, or 4 in. wide to 18 in. deep Send coupon today.

One man can transport from job to job.

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Please send literature on POW-R-SPADE:

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almost the level for the year 1957. . . . The purchase rate from small business concerns and the export sales show a corresponding increase. A prolonged steel strike might change the picture somewhat.

Obituary

SAM H. SHUTT, retired vice president of the former Texas Telephone Co., Sherman, died on Aug. 7.

Mr. Shutt spent 52 years in the industry beginning his career with a small company in central Texas.

S. H. SHUTT

With this start, he worked his way up to the position of vice president and general manager of the Texas Telephone Co. He served that company and its predecessor for 45 years, retiring on July 1, 1953. Texas Telephone Co. has since been acquired by the General Telephone Co. of the Southwest.

Mr. Shutt was a former president of the Texas Telephone Association and at one time was acting executive secretary.

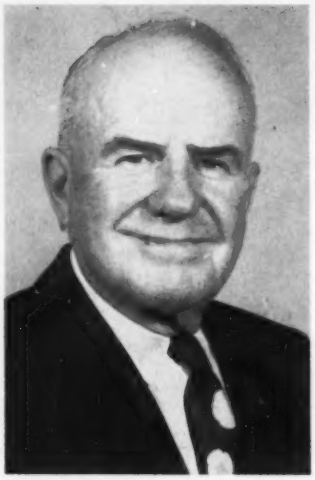
He also had been president of the Independent Telephone Pioneer Association.

Survivors include his wife, and a sister, Mrs. Uttz of Ft. Worth, Tex.

Kelley of Ind. Company Observes 60th Milestone

Eugene Kelley, manager of the Waterloo (Ind.) Telephone Exchange, Inc., is celebrating his 60th anniversary in Independent telephony this year. Mr. Kelley, 80 on July 17, is still actively engaged in his family-owned business.

Kelley, whose grandfather Ab thought the town should have a telephone exchange and started out with 35 subscribers, took the business over when



EUGENE KELLEY

his grandfather died in 1911. Today, his sons, Grant, as purchasing agent, and Alfred, as plant superintendent, maintain the Waterloo company.

The company was modernized and cut over to automatic operation in 1946 at a total cost of $100,000. It provides service to more than 700 subscribers in Waterloo and its environs.

Providing a Favorable Climate

Speaking before the National Association of County Officials, Illinois Governor William G. Stratton outlined what he considers "a favorable climate for industry." In regard to utilities, he said:

"No industry will locate, and few will remain, in an area in which utility costs are exorbitant or in which utility facilities are inadequate. Here, in this case, the states have a tremendously important role.

"State regulation can make or break any utility, be it power, gas, or communication. Enlightened state administrations are generally careful to see that production of utility facilities are encouraged, with reasonable profit to the investors and equally important, with reasonable rates to the consumers including industry.

"I believe there is no other field of more importance in this broad picture of state cooperation with local areas than the proper and reasonable regulation of utilities."

ABC OF THE TELEPHONE

Continued from page 20

money will be available for other capital expenditures.

In some instances the length of an open wire span is limited by the transposition pattern or interval applied to the line. If transpositions are to be made at 350 foot intervals, span lengths could be limited to this distance.

The span length limitation is not absolutely essential. Span transposition brackets can be used if a transposition must be made in a span. However, on many lines, a transposition pattern based on the longer spans is satisfactory.

The new high strength open wire is also ideally suited for maintenance replacement on existing pole lines with shorter span lengths. Under these circumstances the stronger wire increases the safety factor.

In many cases the reconstructed line has sufficient strength to withstand the severest storm load experienced in an area. This is important, especially on toll or trunk lines where a maximum of safety is required.

New Spacers Keep Lines from Tangling

The use of longer open wire spans means the wires hang free in the air for greater distances. The wind moves the wires about and, generally, two wires hanging side by side do not move in unison. Considerable sag is specified in a long span and this leaves a greater amount of wire free to move in the span. When these three factors are grouped together there is a distinct possibility that occasionally adjacent wires may make contact or hit in a span.

Plastic separators or spacers can be used to prevent adjacent wires hitting together in the span. At first reading this may not appear to have much significance. By looking further into the various aspects, these inexpensive spacer units have definite advantages in the successful application of long-span open wire lines.

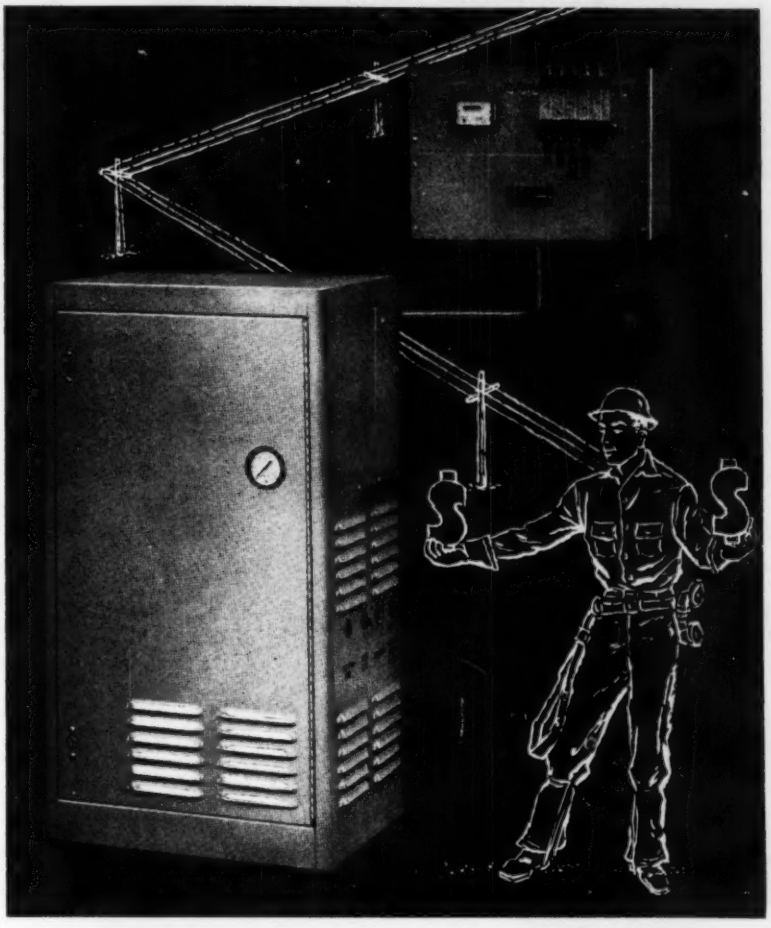
As has been previously discussed, the new high strength line wires can be supported in spans of 500, 600, 800, and possibly more feet under some circumstances.

There are no reasons why spans of these lengths should not be practical. This, of course, assumes that shorter spans are not required for distribution of subscriber drops or circuits from the open wire line.

The provision of adequate separation

PUREGAS...

A DIRECT LINE TO LOWER MAINTENANCE COSTS



PRESSURIZING CABLES WITH DRY AIR *SAVES ALL WAYS*

Records show cable maintenance costs decrease materially when lines are pressurized with PUREGAS Dry Air. Sheath breaks can be detected as they occur, allowing, in most cases, the supervisor to schedule orderly repairs during the regular working day. PUREGAS equipment automatically maintains air pressure in the sheath to keep moisture, dirt, and corrosive fumes from reaching the conductors. Even during floods, PUREGAS Dry Air equipment established records in protecting cables against water damage.

Free more maintenance dollars and extend cable life . . . Pressurize with PUREGAS. Learn how economical it is to pressurize all *cables with PUREGAS Dry Air equipment. Write today for Bulletin 110, "Why should cables be pressurized?"*

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of the line wires is about the only other reason one might consider shortening a span if a longer span would be as satisfactory. Compared with the small cost of the wire spacer units, an additional pole is very costly, just to provide adequate separation of wires and circuits.

As a general rule, the spacer units are used at intervals corresponding to the usual concept of short-span construction. For example, if the spans are 600 feet in length, spacers can be located 200 feet from either pole. This would provide spacing of wires and circuits every 200 feet along the line. The result would be the same as though spans were only 200 feet long instead of 600 feet long. A typical spacer unit installation is illustrated in *Fig. 2.*

The use of wire spacers generally raises a question of how much leakage occurs between the wires at the point where the spacers are installed. The test results for a typical plastic spacer designed for this purpose indicate that the wire-to-wire resistance at the spacer is greater than the resistance measured across two typical insulators used on exchange or toll lines.

This should not be interpreted to mean that insulators designed for exchange and toll open wire lines are not satisfactory. On the contrary, these insulators are highly satisfactory and do

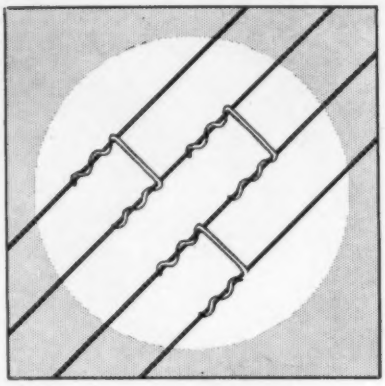

Fig. 2.

a most commendable job under every conceivable line and weather condition.

Instead, this comparison is mentioned to demonstrate that the typical plastic spacer covered by the tests can be used on open wire lines without danger of impairing transmission efficiency.

At this point two statements can be made about the new type open wire lines:

(1) Long open wire spans can be used to reduce construction costs.

(2) There is no reason to run the risk that the wires will tangle or make momentary contact in the span.

(To Be Continued)

IMPACT OF TELEPHONE COMMUNICATION

Continued from page 34

Personal income in 1957 was 16,364 million dollars.

Employment distribution in 1958 was as follows:

Type of Employment	*Percentage Distribution*
Total employment	100.0
Mining	5.3
Contract construction	6.6
Manufacturing	19.6
Transportation and other public utilities	9.3
Trade	27.5
Finance, insurance and real estate	4.6
Service and misc.	12.1
Government	15.0

New Mexico

The per capita income in 1956 was 1,494 dollars and 352 dollars in 1939, an increase of 324.4 per cent. This was below that for the region.

In millions, population was 0.7 in 1956 and 0.5 in 1939, an increase of 49.4 per cent; households in 1956 were 0.2 and in 1939 0.1, an increase of 65.3 per cent.

Telephones, also in millions, numbered 0.2 in 1956, and business absorbed 39.0 per cent of the total; and 46.5 per cent of the total in 1939. The increase in total telephones from 1939 to 1956 was 467.8 per cent, the highest increase in the region.

Manufacturing establishments, in thousands, numbered 0.2 in 1939 and 0.1 in 1900. Employment was as follows: 17.0 in 1956; 4.1 in 1939; 2.5 in 1900.

Payrolls, in millions of dollars, were 78.0 in 1956; 4.1 in 1939; and 1.2 in 1900. Value added by manufacturing was 133.0 in 1956; 8.6 in 1939; and 2.0 in 1900.

There were, in thousands, 229.9 telephones in 1958, with 87.8 for business and 142.1 for home use.

Personal income in 1957 was 1,399 million dollars.

The distribution of employment in 1958 was:

Type of Employment	*Percentage Distribution*
Total employment	100.0
Mining	8.4

HERE'S ANOTHER

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MICROWAVE TOWER

Special microwave tower designed by Stainless to support eight 6-foot parabolas.

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NORTH WALES • PENNSYLVANIA

Contract construction	8.2
Manufacturing	10.0
Transportation and other public utilities	9.7
Trade	21.2
Finance, insurance and real estate	3.5
Service and misc.	12.6
Government	25.8

Arizona

The per capita income in 1956 was 1,718 dollars and 477 dollars in 1939, an increase of 260.1 per cent. Expressed in millions, there were 0.9 people in 1956 and 0.4 in 1939, a gain of 96.3 per cent. Housing in 1956 consisted of 0.3 units and 0.1 in 1939, a gain of 128.7 per cent.

Telephones, in millions, were 0.2 in 1956, a gain of 430.5 per cent since 1939. Business telephones in 1956 accounted for 36.2 per cent of the total, and 45.2 per cent of the total in 1939.

In 1939 there were, in thousands, 0.3 manufacturing establishments and 0.1 in 1900; employment in 1956 was 35.0; in 1939, 7.9; and 1900, 3.3.

In millions of dollars, payrolls in 1956 ran at 163.0; in 1939, 10.9; in 1900, 2.5. Value added by manufacturing was 278.0 in 1956; 31.6 in 1939; and 12.5 in 1900.

In thousands there were 321.5 telephones in 1958, with 115.3 for business and 206.2 for residence use.

The personal income in 1957 was 1,988 million dollars.

Employment is shown below for 1958:

Type of Employment	*Percentage Distribution*
Total employment	100.0
Mining	6.2
Contract construction	8.4
Manufacturing	14.8
Transportation and other public utilities	8.3
Trade	25.2
Finance, insurance and real estate	3.9
Service and misc.	12.8
Government	20.4

(To Be Continued)

THE OPERATOR'S CORNER

Continued from page 35

(4) When a charge is to be transferred to a third telephone and the call is from a public telephone and the operator is unable to determine if the third telephone is a coin without reaching a distant operator, how should the operator proceed?

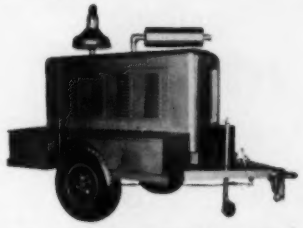
(5) How many telephones are there in the United States?

Answers are presented on page 53.

There's VERSATILITY in TELEPHONE SYSTEM SERVICE and Portability with...

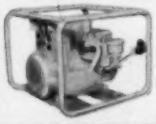
U.S

Complete "versatility" is possible for telephone system service with portable U.S. Versa-Trailer standby emergency power units in sizes from 10 kw to 35 kw capacity.



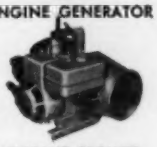
Units provide both single phase power for lights and 3-phase power for other needs. Many exchanges in an area can be served by a single unit.

Telephone systems use U.S. portable generating sets for on-the-spot power needs. Sizes 750 watts and larger, air-cooled.



ENGINE GENERATOR

Portable engine blowers provide convenient means of furnishing fresh air to manholes, or for ejecting smoke, fumes, etc.



ENGINE BLOWER

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A PR MAN VIEWS THE INDUSTRY

Continued from page 26

awareness" button on a person and, automatically, get good public relations performance. It requires a lot of thought, time and effort to build a strong, well-informed, enthusiastic employe group that will join with you in an effort to establish good over-all public relations.

This is, no doubt, why many managements give only lip-service to such a program. This is why it is easier to try to build public understanding through news stories and paid advertising. But, in my opinion, news stories and advertising are simply additional aids in the broad field of public relations, and cannot be effective substitutes for the tremendous value that good employe impact can have on a community.

I am sure many companies consider their employe groups as a sort of "big family affair." This is many times useful and comfortable. But, in all honesty, the "family affair" relationship will not produce the results we are looking for here, unless the conditions for well-informed employe status are met.

Other Requirements

What are some of the other requirements necessary to have well-informed employes? They must have a general knowledge of the history of the company; have an understanding of regulations and the functions of the state commission; know who are the owners and officers of the company; know why a telephone company must be a "monopoly"; have an understanding of the financial requirements of their company; where the money comes from for expansion and why the company must increase its rates occasionally.

The answer to the points raised are familiar to those who deal with them regularly—some are tools of management. But, in most instances, they are unfamiliar subjects to employes. In order to give employes confidence in dealing with such matters, they must be given easily understood answers to these questions, and all other information that a well-informed employe needs.

Immediately, this poses another problem. That of communications to employes. For our immediate purposes, we are concerned with a one-way, up-to-down type of training and communications. This is necessary in order to impart information—such as referred to above. Certainly this type of communications is important, but it is not necessarily the most important. We should create avenues of communications within our organizations that will provide a free-flow of opinion, ideas and comment from the newest employe in his beginning position to every level of supervision. Unless a company has paths for information to flow, it will be fighting its public relations battle with a vitally important weapon out-of-service.

Enthusiasm Is Essential

The other adjective used to describe the kind of employe who can do a job for us in our quest for public enlightenment was "enthusiastic." The term, "enthusiasm" has not gained in stature in recent times, or in the more sophisticated circles. As a matter of fact, enthusiasm in many minds today is associated with the very youthful—the immature—and is considered a raw material substitute for experience and knowledge. From a public relations point-of-view, however, I believe enthusiasm in employes to be an extremely important ingredient in the recipe of success when seeking community support and understanding. The type of enthusiasm I speak of is born of confidence and reflects optimism in the ultimate success of the company in its effort to provide the best, the most useful, and the most profitable service.

An enthusiastic employe group mirrors the spirit of successful, progressive, public-spirited, service-conscious, profit-minded management. The type of enthusiasm I speak of will impel employes to speak up in behalf of the company, using the information and training the company has provided to cultivate better-informed customers and a generally sympathetic understanding climate of public opinion.

From a public relations man's point-of-view employe enthusiasm is a precious thing that should be valued highly by the company so fortunate to have it, and diligently sought by those who do not have it. But, again this state of being is not easy to create, and disappointment and occasional failure crop up along the way for those who work for it. And, again, it is the strength of management that decides the fate of such a plan.

Changes Other Attitudes

It may be that you think this public relations view of the telephone business has to put too much emphasis on a single phase of telephone company operation. It's true, we haven't talked about business-office customer contacts, collection treatment of delinquent ac-

LOOKING OR DOING?

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Many pole owners have inspection procedures in their standards and some actually follow them. At present, though, even the most thorough inspection-only methods just give you a ringside seat to *watch* decay progressing.

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counts, sale of service, preparation for a rate case, sales potential of customer contacts, dress and conduct of installer-repairmen, importance of proper and safe procedures in building plant in the public's view.

Instead, we have dealt with management's responsibilities to create a better public understanding of the company's service objectives through its employe group. But, I offer you this challenge—make a dedicated and sincere effort to achieve a better climate of public understanding by creating well-informed, enthusiastic employe groups and see if you can possibly avoid revamping some of your previously-held opinions regarding many of your present business office practices, see if you can avoid teaching your employes the importance of creating sales through customer contacts; try to avoid creating more effective collection treatment; try to keep from giving the public a better understanding of the need for adequate rates; try to accept the results of your present-day customer and public contacts by your plant forces.

You simply can't do it. By your very effort to make your employes more useful and productive, you will, automatically, and, in many cases, dra-

Answers to Questions On Page 51

(1) Yes.

(2) If the "bill to" place is outside of your Toll Center Area, enter in full the names of the calling and called places and the name of the place where the third telephone is located. Central office names may be abbreviated.

(3) The operator will encircle "T & C" on the ticket and quote the charge to the third number at the end of conversation.

(4) The operator will tell the calling party that she will call him. Check the class of the third telephone as provided for checking the class of telephone on a collect call. If the operator finds that the third telephone is a coin, she will enter in the space for reports, for example, "(third tel.) pre (time)." The operator will reach the calling party and advise him that she is unable to transfer the charges. If the third number is not a coin, the operator will proceed as on a paid call.

(5) There are now approximately 67 million telephones in the United States.

The name Klein on leather goods is known and preferred by linemen and electricians everywhere. Klein tool belts, safety straps, pouches and pockets represent the highest in quality, the safest in design and construction.

In safety straps, Klein-Kord was the first specially woven fabric strap designed to permit the use of a tongue-type buckle without risk of slitting or ripping, even under severe strain.

Now Nylon Klein-Kord safety straps are the newest Klein development offering maximum safety with maximum flexibility. These are the only nylon straps designed to meet the tests given in Edison Electric Institute Report AP-2.

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A copy of the new Klein Pocket Tool Guide will be sent on request.

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Mathias Klein & Sons

matically retrain, reorient and reeducate yourself in the telephone business. By helping others, you will—without fail—help yourself. And, this public relations point-of-view will prove to be exciting, interesting and profitable for all.

GRADUATES URGED

Continued from page 22

"Some forward-looking companies," he admits, "have made a significant beginning in accepting the responsibility."

But, of course, Mr. Gardner contends, while every institution in our society should contribute to this fulfillment, "obviously, the primary responsibility for learning and growth must rest with the individual, who must foster his own development."

What Is Fulfillment?

And widening the scope of his audience, the Carnegie president says that "at any age, the chief resource must be the individual's own interest, drive, and enthusiasm for self-fulfillment."

The individual, says Mr. Gardner, "may be helped to raise his sights and to recognize his own abilities. And he may be assisted in the development of values which will give meaning and direction to his own fulfillment.

"Happiness, despite popular notions to the contrary, is not best conceived as a vegetative state in which all one's wishes are satisfied and all one's hopes fulfilled.

"For most human beings, happiness is more surely found in striving toward meaningful goals. There is no more lasting service to a young person than assistance to him in the development of such meaningful goals."

"We propose," suggests Mr. Gardner, "that the American people accept as a universal task the fostering of individual development . . . an all encompassing goal, to benefit citizens of every age, in every significant situation, in every conceivable way.

"By doing so, we shall keep faith with our ideal of individual fulfillment, and at the same time ensure our continued strength and creativity as a society."

In this nation-wide program, he continues, "It is the sacred obligation of the schools and colleges to instill in their students the attitudes toward growth and learning and creativity which will in turn shape the society."

Under the ideal of an on-going program of life-long education toward fulfillment, Mr. Gardner says in summary:

"We shall have strengthened American education—and therefore the nation—in precisely that respect in which it differs most profoundly from the Soviet model. We shall have enhanced precisely that quality which the USSR can least easily imitate. Indeed, we shall have accepted a commitment which promises much for our way of thinking about the purposes of democratic institutions and the purpose of individual striving."

Summary

It appears that in the area of "reshaping and re-evaluation" of self, which Mr. Gardner sees as so vital, industry, through its various educational programs for employes, has made a beginning.

In the matter of the waste of human resources, which both Mr. Gardner and Mr. Kappel deplore, and which management and the nation finds so costly, it is well known that some human conservation efforts are under way. For example, the loan of men of industry to the government can be termed an ex-

Presenting now the

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5. Improved capacity probe, 10 times greater pick-up, can be "hooked" onto proper pair with one hand and pair moved and held away from other pairs for positive identification
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7. Instructions included for a simple connection on the Receiver to convert it to a source of low frequency tone—so that the splicer can pick out a spare pair for a talking pair and the helper can locate it in the central office with a monitoring set
8. A convenient and durable carrying case is now available for carrying the silent buzzer, all cords, batteries, the Field Test Board and the Speed Tester for maximum protection during storage and transportation
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10. Transmitter uses only 5 ma from a 4½ V battery. Receiver uses only 6 ma from a 4½ V battery, or a total for both of only 49.5 milliwatts—from low cost batteries.

Net price $194.00 per pair—f.o.b. Houston, Texas.
Shipping schedule—90 days. Write for additional information on this and other telephone test equipment manufactured by

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tension of the program of life-long education through the experience of government service.

Here and there, industry retains a valuable man as a consultant, though he has retired from the active staff, and thus, both his company and the nation continue to benefit from his knowledge, which has been a lifetime in the building.

As the nation broadens the scope of such a program of life-long education, both formal, and beyond the formal, increasingly toward the fulfillment of the individual, it may be assumed that commencement speakers, including those representing telephony, will give the subject even greater impetus. Indeed, they may find it a fruitful message when they address commercial and other groups having a growing interest in education.

FARMER AND TELEPHONE

Concluded from page 31

by the telephone industry, but for many other purposes, such as hearing aids, portable radio sets, satellites, etc. Our inventors should get busy on this. In fact, many are now working on this project. We hear of a proposed atomic battery for a satellite that would be practically everlasting. Another proposal is a storage battery kept charged by a solar battery. One man is working on an atomic battery no larger than a pea which would power a hearing aid for the life-time of the user. If this is perfected it would power a telephone transmitter and have many other telephone uses where a small amount of power is required at a distance from the central office. We believe that the chemical primary cell can also be improved and perhaps a sealed storage battery that would operate several years without attention could be developed.

We will continue this discussion in the next section of "The Farmer and the Telephone."

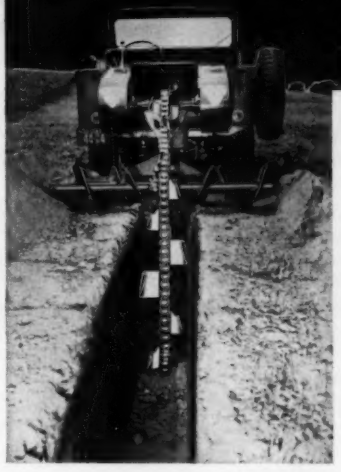
Strength In Solitude

"In solitude the mind gains strength, and learns to lean upon herself; in the world it seeks or accepts of a few treacherous supports—the feigned compassion of one, the flattery of a second, the civilities of a third, the friendship of a fourth—they all deceive, and bring the mind back to retirement, reflection and books."—STERNE.

Weekend Weakness

In 1958, more than 49 per cent of the traffic injuries resulted from weekend accidents.

LET AUBURN TRENCHERS CUT your TRENCHING COSTS!



If you want your trenching done at less cost, and with less trouble, you want **Auburn.** This simple, time- and customer-proven machine digs where other trenchers won't even start. It has a variable speed, hydraulic drive that automatically adjusts speed to changing soil conditions, and it operates up to 800 feet per hour. **Auburn** costs less to own, requires less maintenance, seldom has any downtime, and is one-man operated. It has interchangeable digging bits and boom that let you dig from 6 to 14 inches wide, down to 6 feet deep. Special digging bits are available for rock, shale, and frozen ground.

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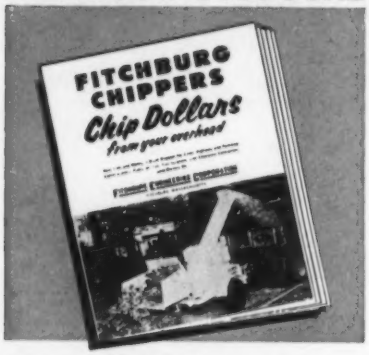

Read how foresters, tree surgeons, highway and park commissions, telephone, power and gas companies cut brush disposal costs up to 50% with a Fitchburg Chipper.

See cut-away color drawings of the Fitchburg Chipper—the exclusive Fitchburg spring-activated feed plate—pictures of different models in action.

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Helpful Literature

BASIC CIRCUITS—A 32-page booklet designed to serve as a guide to determine the availability of a circuit and its components, is now available from Automatic Electric Co.

The pocket-sized catalog contains line drawings that show relay transfer trees, relay coil symbols, and relay coil terminal connections.

Other sketches illustrate slow-operating and slow-releasing circuits, relay locking circuits, pulse generators, pulse stretching, ac rectifier circuits, rotary switch circuits, etc.

In addition to the pamphlet, the company is offering a relay and switch symbol template to simplify and standardize circuit drawings. Request HL510.

•

SOLID-STATE COMPUTER—The new Univac Solid-State Computer is fully explained and illustrated in a colorful 12-page booklet just announced by Remington Rand Division of Sperry Rand Corp.

Compatible to any punched-card installation, and representing a major breakthrough in the field of data-automation, this new system provides high-speed processing at relatively low cost, compactness, and unsurpassed accuracy and reliability, the company states.

Advanced solid-state design is the difference, according to Remington Rand. Because of tiny magnetic-core amplifiers and transistors, it can be operated in an area as small as 575 square feet. These new devices emit little heat, and power requirements are low.

Ease of maintenance is built right into the system for full-time operation and peak processing performance, says the company. All parts are easily accessible. Electronic circuits, for example, are printed on plastic cards about the size of a standard postcard, located in the front of the central processor for fast servicing and testing.

The company reports programming is greatly simplified. With the Remington Rand Flow-Matic method, programming has been made more understandable, training time has been drastically reduced, and management is thus moved much closer to the actual computer operation.

One of the fastest computing systems ever developed, the Univac Solid-state Computer performs at interval speeds commonly associated only with large-scale equipment, according to the company. Its speed and storage capacity make possible the elimination of much pre-sorting and pre-collating and the combining of calculating, reproducing, gang-punching, data-collating, and tabulating in a single run. Request HL511.

•

SAFETY-EQUIPMENT—The Atlas Safety Equipment Co., Inc. has recently released its 19-page 1959 catalog.

The safety equipment described is for use by linemen, electrical workers, forestry workers, and others.

Each item available is illustrated and the catalog contains descriptive information on safety belts, straps and harnesses, rope safety nets and ladders, and emergency crash axes with

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8/22/59

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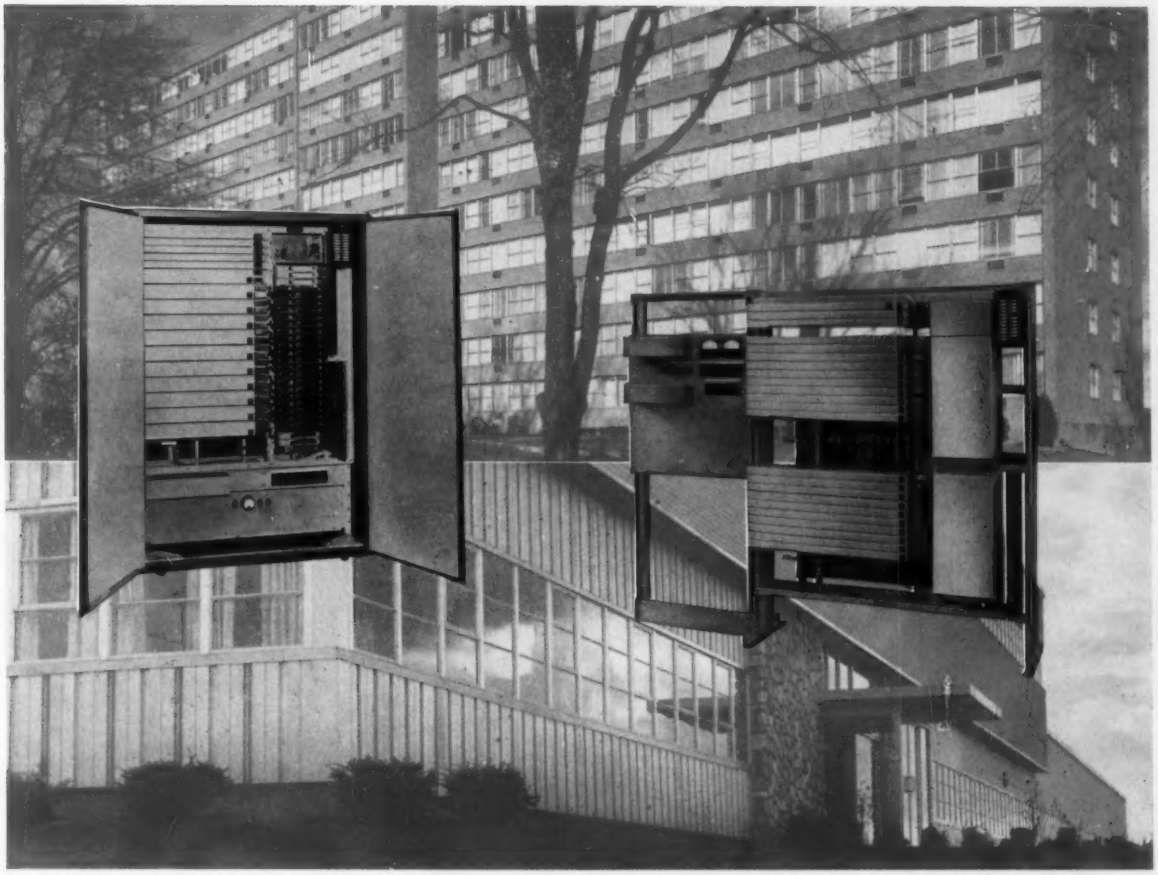

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Also included are: reflectorized belts, boatswain chairs, tool holsters, snap hooks, rope lanyards, climber's pads, carrying slings, and tie lines. Order numbers are given for each article offered. Request HL512.

•

ELECTRIC CLIPS AND INSULATORS —The June catalog of the Mueller Electric Co. describes its complete line of electric clips, including solid copper and cadmium-plated steel clips and flexible dielectric insulators to fit.

The company's line from miniaturized clips to welding ground clamps, is reviewed and is shown in drawings and photos.

Newest developments, such as skin-tight insulators to fit a wide range of clips, colored insulators, and an alligator clip adapted for telephone tip or test prod tip, are included. Request HL513.

North Appoints Four To Area Sales Posts

M. G. Ryon, sales manager for the North Electric Co. has announced four new sales appointments.

Charles C. Moody has been named staff sales engineer for North and South Dakota, Minnesota, Nebraska, Iowa, Kansas, and Missouri.

C. C. MOODY

William E. Clendenin is salesman for West Virginia, Virginia, Kentucky, Tennessee, and North and South Carolina.

Donald Gype becomes sales representative for Ohio, Indiana, and Michigan.

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William Vanderlaag is salesman covering Pennsylvania, New York, New Jersey, and the New England states.

W. E. CLENDENIN

Charles C. Moody has spent over 18 years in the industry. He has extensive experience in crossbar engineering, having been associated with Western Electric for 12 years and with Kellogg Switchboard & Supply Co. for four years.

He joined North in 1957, and was appointed project engineer, crossbar engineering.

He has been in charge of several North crossbar projects, including installations at Galion, O.; Export, Pa.; Crestline, O., and the crossbar system built by North for the first RCA BMEWS overseas installation. Mr. Moody will provide technical and engineering assistance in his territory. He will headquarter in Lincoln, Neb.

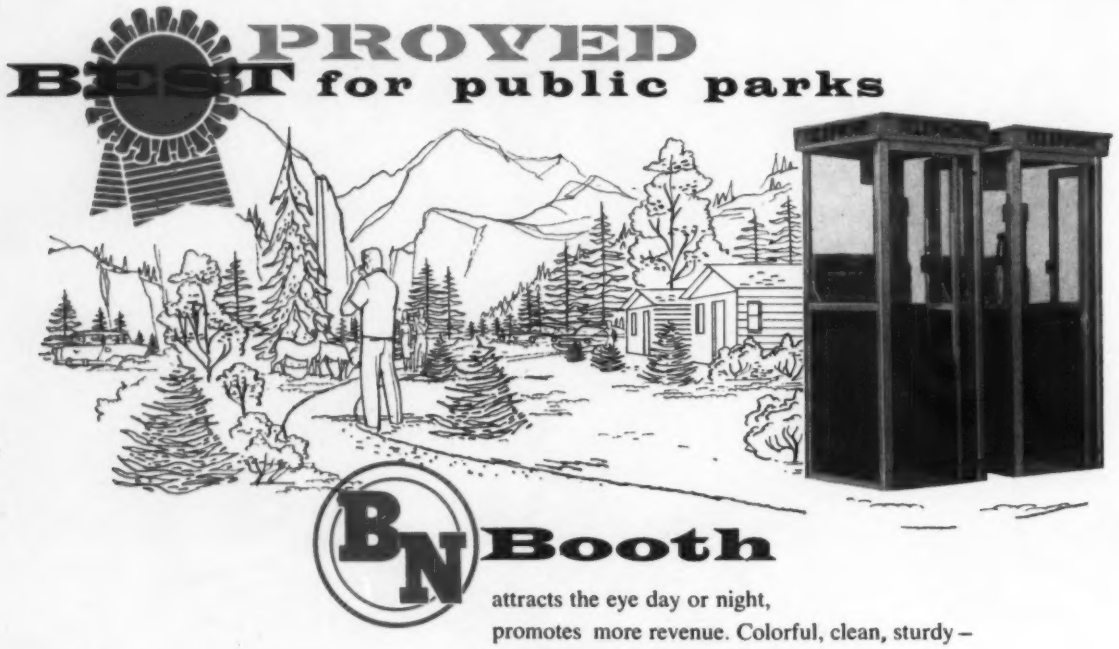
William E. Clendenin joined North Electric in 1955 as an assistant production supervisor. In 1956, he was promoted to production supervisor, assembly department. He was named manager of this department in 1958—the position held until his new appointment. Mr. Clendenin brings to this assignment a sales background with other firms as well as telephone equipment knowledge gained during his four-year association with North's various production and assembly techniques. He will reside in Charlotte, N. C.

Donald Gype is a graduate of the University of Toledo. Mr. Gype's introduction to telephony was as a management trainee for Western Electric Co. Later, he was transferred to Western's Hawthorne plant as an equipment engineer.

DONALD GYPE

His most recent assignment was with Western Electric's Cleveland area installation division as a field supervisor, in charge of various central office installations for Ohio Bell.

He became acquainted with West-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The 6K-1 system by Stromberg-Carlson is a "finger-tip PBX" for small offices and for departmental use. Multi-line key telephone provides hold and transfer . . . dial selective intercom for up to 15 stations . . . "busy" lamp indication . . . intercom flashing . . . "executive right-of-way." Contact your Stromberg-Carlson representative.

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ern's No. 1 and No. 5 crossbar, as well as with tandem crossbar and CAMA.

In his new position, Mr. Gype will provide sales-service for operating companies in the tri-state region. He will headquarter in Chesterland, O.

WILLIAM VANDERLAAG

Mr. William Vanderlaag will reside in Springfield, Pa.

A graduate of William Jewell College in Missouri, Mr. Vanderlaag became a sales trainee with Automatic Electric in 1955. Later, he was promoted to the position of sales correspondent for the states of New York and Pennsylvania, and the New England area.

In 1958, he joined Kellogg Switchboard & Supply Co. as a field representative for Florida, Alabama and Georgia. He handled military, industrial and operating company accounts in this region.

Mr. Vanderlaag will team with Keith Holser, North's staff sales engineer, to provide an engineering-sales relationship in the eastern region.

Stromberg Appoints Two In Telecommunication Sales

T. C. Thompson, general sales manager of Stromberg-Carlson's Telecommunication Division, announces the appointment of James D. Young as sales engineer with the company's Chicago branch sales office, and James E. Howell as sales representative with the Kansas City office. Stromberg-Carlson is a division of General Dynamics Corp.

Until his recent appointment, Mr. Young was sales representative serving the west Texas-New Mexico area from the Kansas City office. Mr. Howell, formerly assistant chief installer, will fill the post left vacant by Mr. Young's new appointment.

J. D. YOUNG

Mr. Young has been with Stromberg-Carlson since 1948, having joined the company as installation foreman after spending some time with the Western Electric Co.

In 1955 he was promoted to service engineer with the Kansas City branch, and served many customers in the

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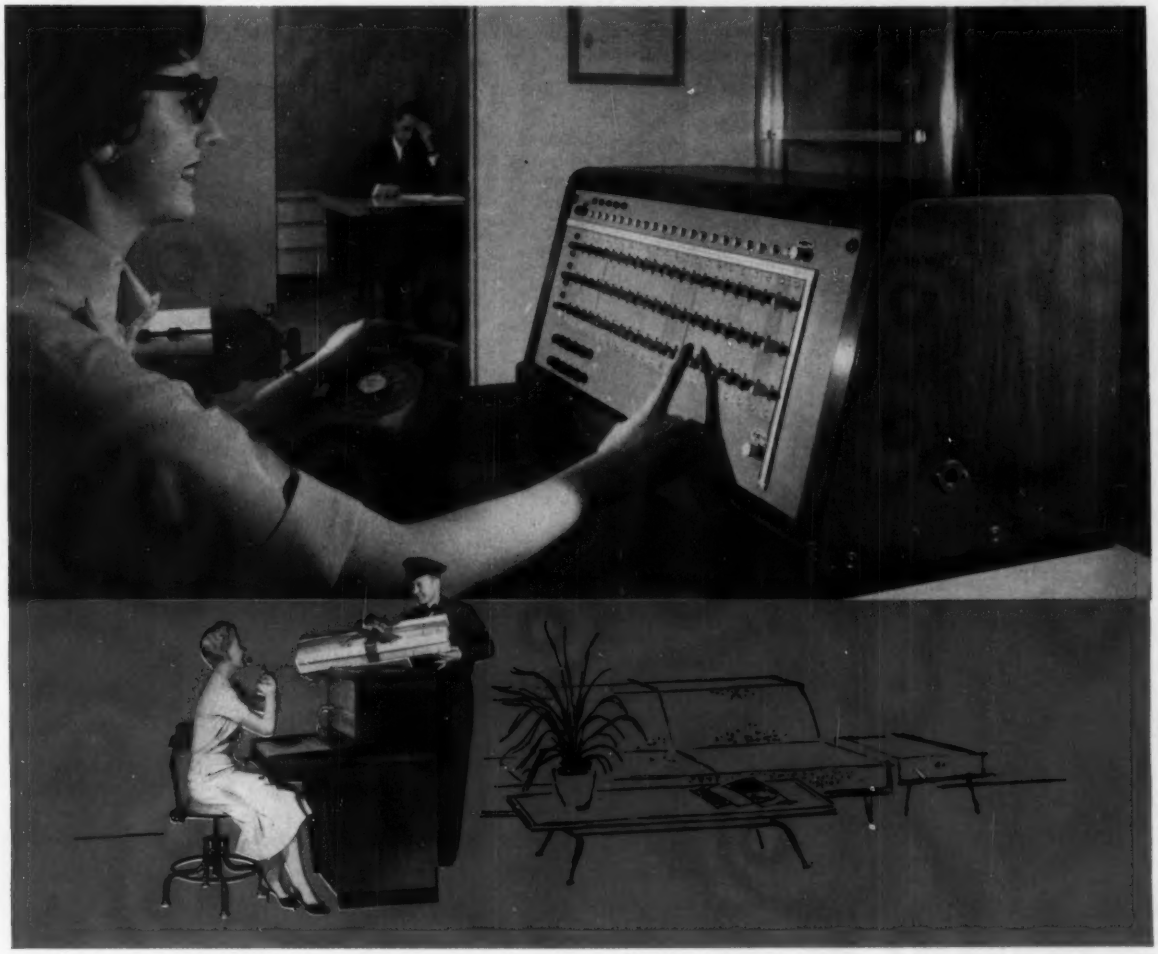

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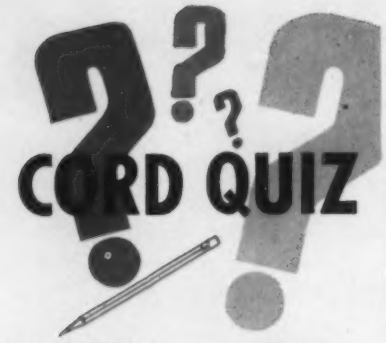

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same area where he spent his early years. He was appointed sales representative for west Texas and New Mexico early in 1956.

J. E. HOWELL

Born in San Antonio, Mr. Young spent his boyhood in Texas. He joined the U. S. Navy in 1941 and was in active service until 1946, when he began his career in telephony.

Mr. Howell joined Stromberg-Carlson in 1951 as an installer, and soon was promoted to installation foreman. In the latter capacity he was responsible for installations of XY Dial equipment ranging up to 2700 lines.

He continued in that position until his promotion last year to assistant chief installer. He was responsible for the assignment and direction of installation personnel in the field, and devoted much of his time to field inspections.

Born at Elrod, Ala., Mr. Howell received his education in Tuscaloosa schools, including the University of Alabama, where he majored in engineering.

Prior to joining Stromberg-Carlson, he had been a division manager for Sears Roebuck & Co., in Tuscaloosa. He also served as a Western Electric installer, and as an interior communications electrician with the U. S. Navy.

Eternal Vanguard

"In that vast march, the van forgets the rear; the individual is lost; and yet the multitude is many individuals. He faints and falls and dies; man is forgotten; but still mankind moves on, still worlds revolve, and the will of God is done in earth and heaven."—G. W. CURTIS.

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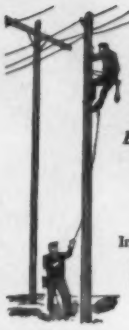

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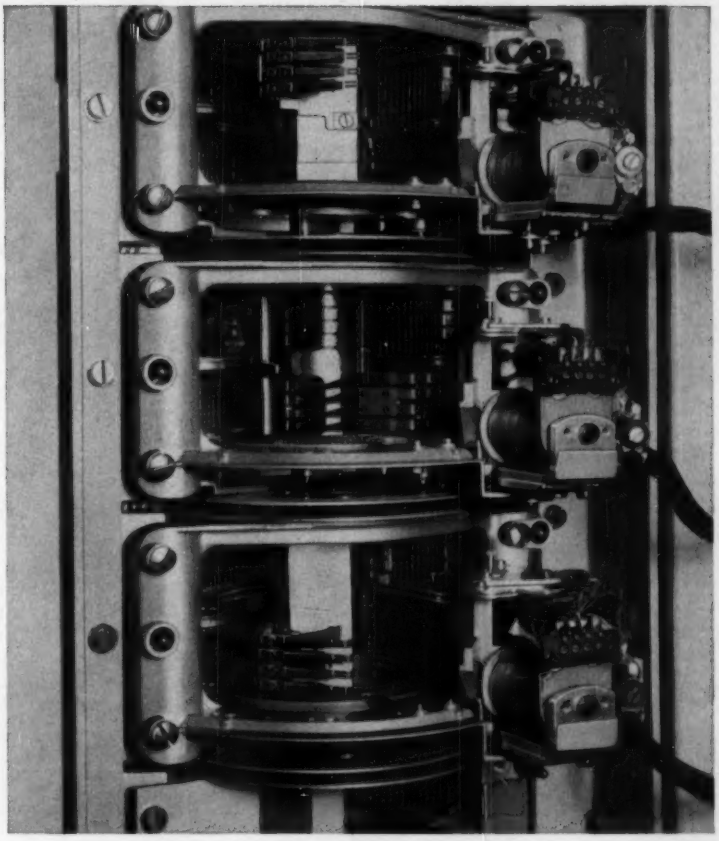

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